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THE CHEMICAL AGE

VOL LVII 22 NOVEMBER 1947 No 1480

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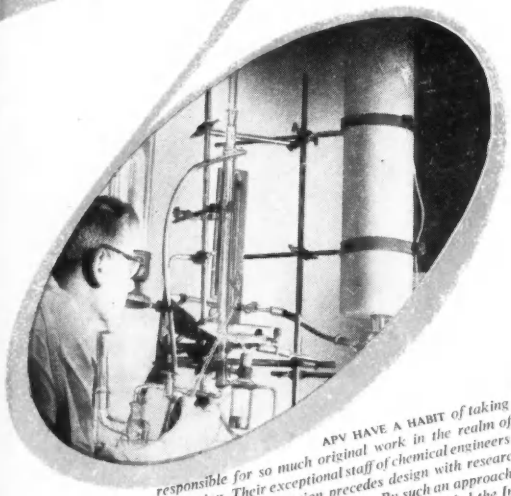

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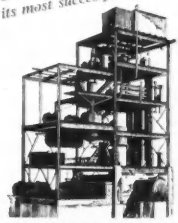

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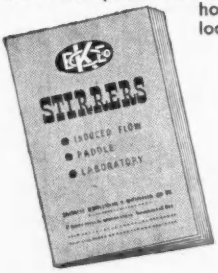

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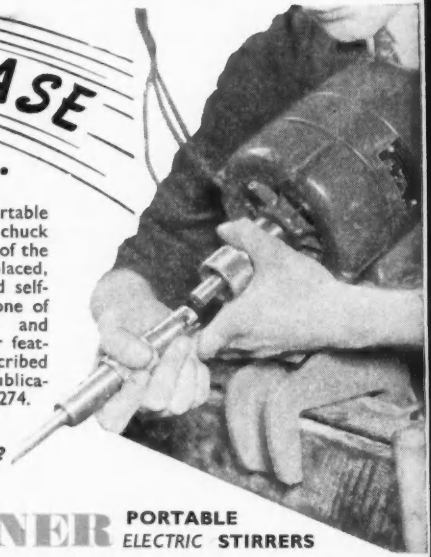

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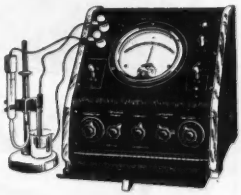

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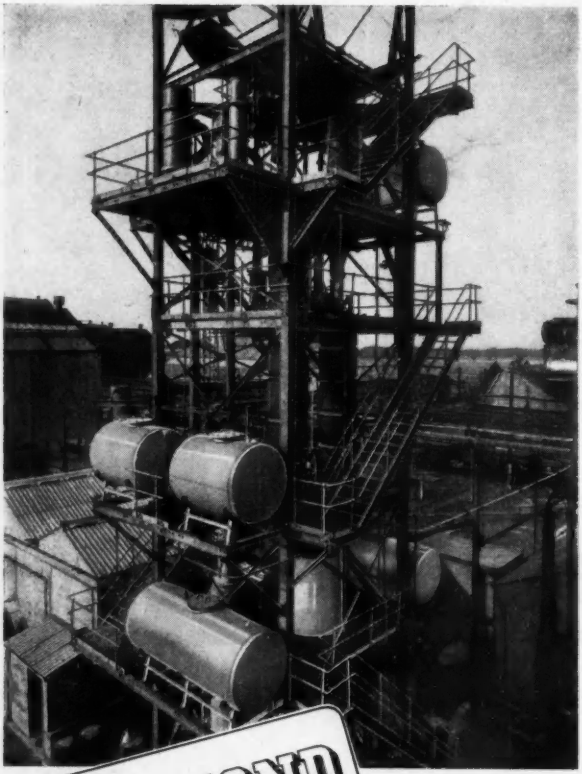

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INDEX TO ADVERTISERS
IN THIS ISSUE

	Page
Allen, Athole G. (Stockton), Ltd.	v
Aluminium Plant & Vessel Co., Ltd., The	Front cover
Bamag, Ltd.	685
Beecham Group, Ltd.	xvii
Berk, F. W., & Co., Ltd.	xiii
Blackwells Metallurgical Works, Ltd. ...	xxii
Blundells & T. Albert Crompton & Co., Ltd.	Cover iii
Boots Pure Drug Co., Ltd.	xiv
British Carbo-Norit Union, Ltd., The ...	xxii
British Drug Houses Ltd., The	xvi
British Thomson-Houston Co., Ltd., The	vii
Clark, T. & C., & Co., Ltd.	iv
Classified Advertisements	xviii, xix, xx
Cole & Wilson Ltd.	688
Collis, J., & Sons Ltd.	xv
Drum Engineering Co., Ltd., The ...	Cover iii
Everett, Edgecumbe Ltd.	iii
"Fullersite," H. B. Gould	xx
General Chemical & Pharmaceutical Co., Ltd., The	xx
Gethings, B., & Son	Cover iii
Grazebrook, M. & W., Ltd.	iv
Harris (Lostock Gralam), Ltd.	Cover iii
Harris, Francis W., & Co., Ltd.	xxii
Haughtons Metallic Co., Ltd.	xxii
Haworth, F., (Acid Resisting Cement), Ltd.	xii
Holland, B. A., Engineering Co., Ltd., The	x
Hopkin & Williams, Ltd.	vi
Imperial Chemical Industries Ltd.	xi
Jobling, James A. & Co., Ltd.	viii
Kestner Evaporator & Engineering Co., Ltd.	Cover ii & xxii
Klinger, Richard, Ltd.	687
Laporte, B., Ltd.	x
Leigh & Son Metal Works	xxii
Lennox Foundry Co., Ltd.	xxii
London Aluminium Co., Ltd., The	ii
Muirhead & Co., Ltd.	i
National Enamels Ltd.	xii
Nottingham Thermometer Co., Ltd., The	xxi
Perry & Hope, Ltd.	xx
Porritt Bros. & Austin, Ltd.	xxi
Porter, S., & Co., Ltd.	xvi
Potter & Clarke, Ltd.	viii
Spence, Peter, & Sons, Ltd.	xiv
Spencer, Chapman & Messel, Ltd.	vi
Staveley Coal & Iron Co., Ltd., The ...	ix
Swift & Co., Pty., Ltd.	xii
T. & T. Works Ltd.	xxii
Tate, James, & Co.	xxi
Ultra Lens Co., The	xxi
Wilkinson, James, & Son, Ltd.	Cover ii
Windsor, H., & Co., Ltd.	Cover iv

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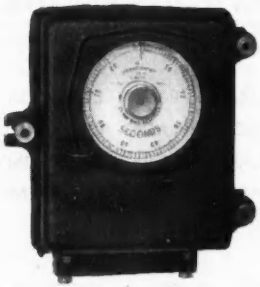

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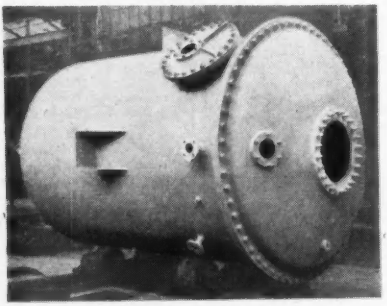

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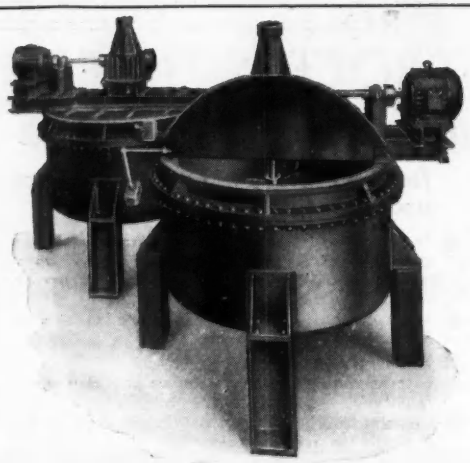

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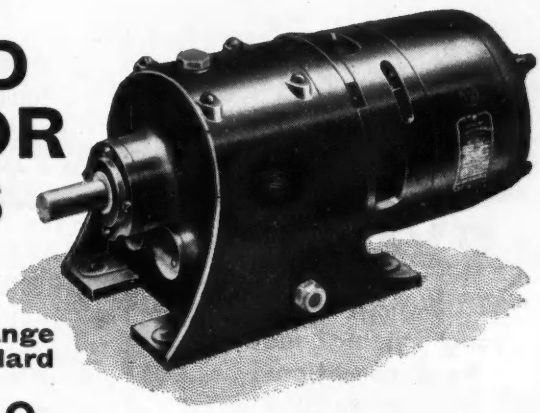

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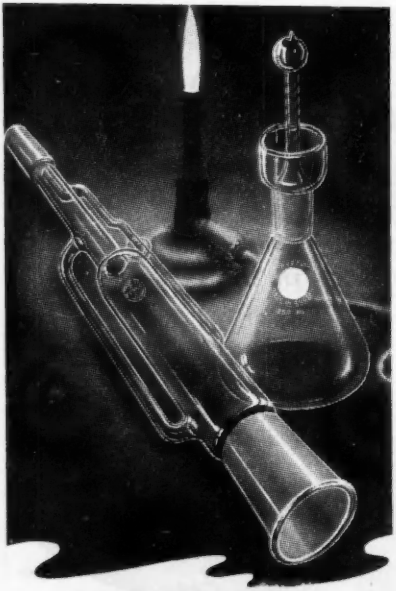

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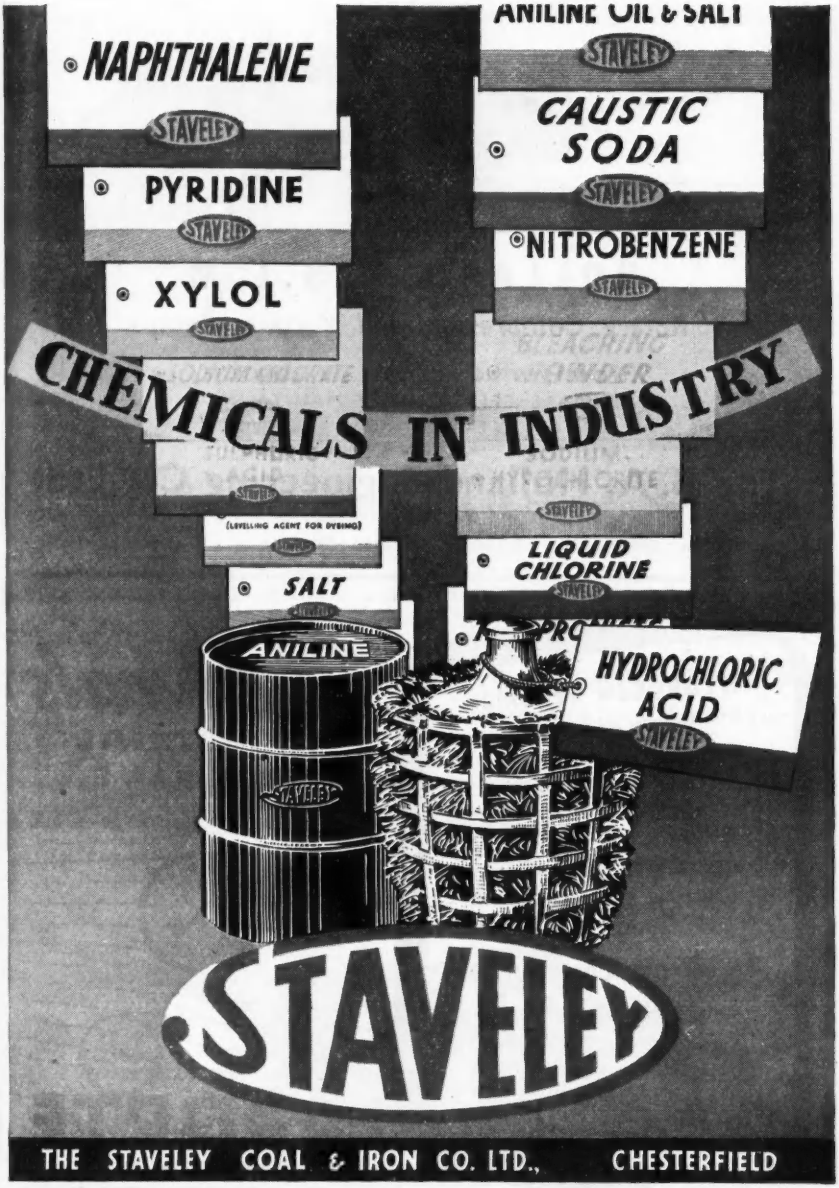
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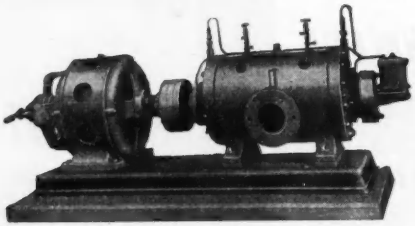

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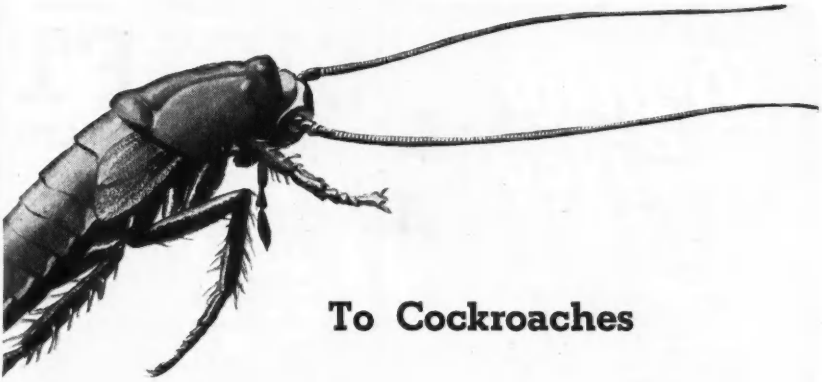

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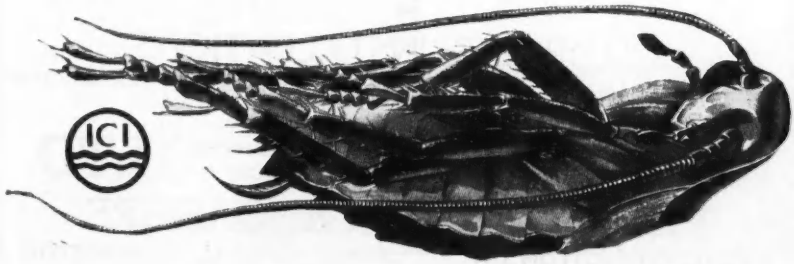

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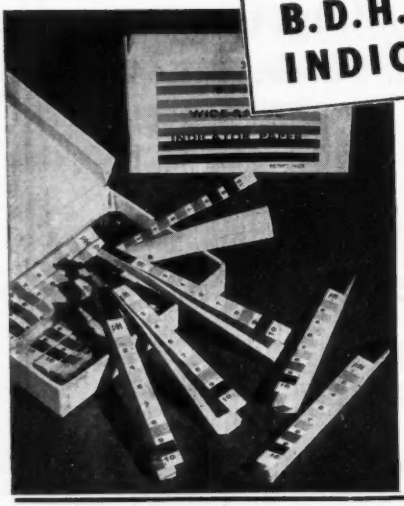

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Education and the Scientist

WE had occasion lately to study a document by a chemist purporting to be a report on a new process. It was intended to convey the result of an investigation, enabling the reader to decide whether or not the process satisfied the claims for it. In fact it did nothing of the kind; he failed to make clear what was the method of test, the manner in which the test was done, or the results achieved. That was a pity because the tests appeared to have been comprehensive, and the chemist evidently had something worth conveying. What that was will, unfortunately, never be fully disclosed.

We are not alone in this plaint. Dr. Ulick Evans has recently spoken at Cambridge of the " many senior members (of the University) who are at present giving up far too much of their time trying to teach the young men the art of expressing their ideas in writing, an art which would have been learned much more easily, and very much less unwillingly, had they been properly taught at school."

Because it is our firm belief that the best foundation for a scientific career is a study of the classics in their original languages we are gratified to know that opinion at Cambridge University is turning towards retaining Latin as a compulsory subject for matriculation. The scientists on the Council of King's College supported that opinion by voting unanimously in favour of it. The practical difficulty lies in the vast and ever growing mass of information that the undergraduate is supposed to acquire. There is not time for everything.

Dr. E. C. Bullard (records the *Cambridge University Reporter*) presented the other aspect of the same problem, claiming that " scientists coming up as graduates know far too much science." There is a tendency to specialise in schools in the belief that it is for the good of the future scientist that he shall have passed Higher Certificate before entering the University, and thus shorten his stay there. The truth is that the schools, while not neglecting science, should be engaged primarily in training minds and forming habits of thought; no doubt knowledge is and must be acquired in the process, but knowledge is a secondary consideration. The lowest form of education, it has been stated, is a knowledge of facts without their contexts.

To render one's meaning clear is manifestly the first literary requirement of the scientist, but much depends on the style in which a treatise is written. It is on record that a young Australian policeman, describing in his report why he had failed to arrest his man in a goods wagon of a moving train, recorded that " Appalling atmospheric conditions prevailed throughout the incident, as surplus coaldust whirled to a parallel, sufficient in density to reduce visibility in the goods wagon to a minimum. These elements are submitted as agents which succeeded in severely neutralising the achievement of my objective." We get his meaning; but the fog in the goods wagon is only paralleled by the verbal fog in which the affair was wrapped. But let not the chemist cast the first stone. Too often his efforts are almost as woolly.

NOTES AND COMMENTS

Lucky Dip

THE lively interest in what may be available as reparations from Germany, evidenced by the numerous requests for information THE CHEMICAL AGE has received since publishing preliminary details from the Foreign Office of scheduled German equipment, will derive fresh stimulus from the provisional list (pp. 667-9 this issue) of chemical plants earmarked by the British and American Commanders for distribution from their two zones. The chief merit of the present summary is the inclusion of brief descriptions of the character of the plant, as well as the names and locations, and names of the British Government departments which may arrange their disposal. *May* is in this connection the operative word. The schedule published fully in the *Board of Trade Journal* is a record of all the remaining plants to be made avilable from the two zones, with the exception of certain non-ferrous metal undertakings, the important synthetic oil, rubber, and ammonia plants, ball and roller bearing and shipbuilding industries. Thirty-nine items are scheduled as chemical plants or parts of them and, having regard to the qualifying statement in the preamble that the United Kingdom share will represent one-fifth of the total value of all equipment, it is evident that the increment to this country's chemical potential will not be hard to absorb. Even making an optimistic allowance for our share of the fundamentally important synthetic plants and non-ferrous metal undertakings not yet scheduled, the gap between what we are to receive and what was taken from us "by enemy action" will not be bridged.

Peaceful Infiltration

FIRST indications are now discernible of what is likely to be the course of events in the self-governing Dominion of India now that this country has relinquished its traditional rôle there. Many factors, however, continue to represent the quantity x in the equation, notably the question who is to provide the executive functions in the field of chemistry and science at large. The answer of an Indian nationalist—Indians—is unlikely to be wholly correct, notwithstanding the eminence in academic affairs of some distinguished Indian scientists. Some light is shed on a possible trend of events by an announcement in the American *Chemical and Engineering News* from its correspondent in Bombay seeking names of highly qualified American chemists and chemical engineers who may be interested to fill the position of director of an industrial research institute "to make the Indian chemical industry more research conscious." The successful candidate, who, incidentally, will be interviewed in the U.S.A., will be offered an attractive salary and a five-year contract. Applicants were asked to see that details were in the hands of the correspondent before December 31.

£12 Million More for Coal

BECAUSE chemical production depends more intimately upon coal than does almost any other industry recent developments in the long drawn out story of coal raising and distribution are of fundamental importance. Necessarily commanding most attention is the notification by the National Coal Board that negotiations with the National Union of Mineworkers " have been brought to a successful conclusion." The success seems to have belonged entirely to the N.U.M., whose 600,000 and more members will now receive 15s. a week more on weekly wage rates if they are underground workers and 10s. if they are surface workers. The consequent addition to the mining wages bill is estimated to run to £12 million or £13 million a year. That serious addition to industry's basic costs could easily be reimbursed by even a moderate heightening of effort in the coalfields, of which in the past few weeks there has been some evidence. In the nationalised industry, however, there are unfortunately no grounds of any kind for assuming the *quid pro quo* principle is to be observed; the weight of evidence, in fact, is otherwise. Presumably to discourage any wishful thinking along those lines the spokesman of the N.U.M. has summed up: The country's " minimum " needs (200 million tons) may or may not be mined this year, but there will be sufficient coal to keep unemployment at bay. This would appear to be a classic example of " the minimum target."

On Other Pages

Leader:
Education and the Scientist ... 663
Notes and Comments:
Lucky Dip 664
Peaceful Infiltration 664
£12 Million More for Coal ... 664
40,000 More Miners 665
New Coal Seam 665
Non-Ferrous Metals 665
World Petroleum Prospects ... 666
German Reparations 667
French Dismantling in Germany ... 669
Modern Methods of Tar Distillation 670
Australian Lead and Zinc 670
U.S. Aluminium Production ... 670
Separating Fine Particles 671
Iron Compounds and Phosphatic Fertilisers 672
National Foundry College 674
American Chemical Notebook ... 675
Parliamentary Topics 676
The Dalton Budget 676
International Awards to English Scientists 677
Rising Coal Output 678
Rocket Research Explosion 678
Technical Publications 679
A Chemist's Bookshelf 681
Royal Medallists 683

40,000 More Miners

HAPPILY, gloom does not characterise the entire picture of coal prospects. The announcement that the mining force is to be reinforced in the next 12 months by 40,000 foreign workers—30,000 European volunteer workers and 10,000 German orphans as trainees—helps to offset the failure to raise the total of English miners to 730,000 by the end of the year. Extraordinary as the expedient appears, considering that the total sought in vain is 36,000 fewer than the 1939 total, the ultimate outcome must be a proportional betterment at least in future coal supplies. Equally encouraging is the more realistic policy foreshadowed by the Minister of Fuel's endorsement of most of the recommendations on fuel utilisation by the Parliamentary and Scientific Committee, and in particular of the principle of allocating coal on a " national priority " basis and of rewarding, instead of penalising, those undertakings which practise fuel economy most successfully.

The custom of basing allocations on what was used a year before has produced some absurd anomalies.

NEW COAL SEAMS

DEEP boring operations during the past six months by the National Coal Board on land adjoining the Whitegate factory, Wrexham, which aim at securing information about the underground strata, have revealed coal seams at the depth at which they were anticipated. A depth of 3000 ft. has been reached by the boring apparatus which is the first of its type to be seen in this country. It is a rotary mud flush drilling machine similar to those used for drilling oil wells in America. This present work is exploratory only, and other holes may be drilled. It is emphasised by N.C.B. officials that there is no intention of opening a new colliery at Whitegate, but if geological research is satisfactory existing mines in the Wrexham area may be extended. Sixty members of the Manchester Geological and Mining Society visited the site on November 14, when a paper was read by Mr. R. Foster, area planning engineer.

NON-FERROUS METALS

CONSUMPTION figures for non-ferrous metals in the U.K., issued by the Ministry of Supply in respect of the third quarter of 1947 (in long tons of virgin metal) are as follows: zinc 54,545; lead 44,650; tin 6346; cadmium 129; and antimony 1545.

A breakdown of these figures, to which scrap metals have been added (zinc 23,434, lead 38,320, and tin 1800) reveals that 26,275 long tons of zinc were used in brass production, 24,732 tons of lead in the manufacture of cables, 3178 tons of tin for alloys (whitemetal, bronze, gunmetal, etc.), 54 tons of cadmium for plating, and 917 tons of antimony for oxides and compounds. A comparison of consumption is as follows:—

	First Quarter 1947	Second Quarter 1947	Third Quarter 1947
Zinc	48,701	57,946	54,545
Lead	42,535	40,237	44,650
Tin	6663	6857	6346
Cadmium	122	130	129
Antimony	1160	1317	1545

Prevention of Frothing

Patent Procedure for Mixed Fertilisers

IN any method of solubilising natural phosphates with nitric acid there is always the problem of frothing with which to contend. Engineering patent application No. 36109/1946, filed by the Office Nat. Industriel de l'Azote, of 35 Rue Emile Barrière, Toulouse, must therefore claim attention, for it relates to a method whereby this difficulty may be avoided.

Precalcination, as used in the Odda Smeltwerke process, is described as unsatisfactory. The new method, which is said to be simple, inexpensive, and to require but little extra power (1-2 kWh/ton), is as follows :—

Into a vessel or vat fitted with stirrer is introduced a suitably proportioned mixture of natural phosphate and nitric acid, together with a quantity of solution from a previous operation (or, if first starting, tapped from the bottom of vat). By thorough stirring, reaction takes place in such a manner that the whole is converted into a light fluid emulsion which is transferred to a perforated vessel revolving at high speed. The emulsion is thereby practically freed from froth.

An important requirement is that the natural phosphate (the portion of liquid previously treated or tapped from the bottom) must be suitably introduced, and recycled through a nozzle from which the phosphate is led into the reacting mass. The frothless material thus obtained may be further treated by known methods, *e.g.*, directly with ammonia. It is also possible to separate a portion of the calcium nitrate by cooling, and then to neutralise it with ammonia or lime.

Example: 1000 kg. natural phosphate is treated with 1700 lit. of nitric acid, and 10 cu. m. of solution from a previous operation is re-cycled at the same time. A sample taken from the outflow is a completely emulsified liquid. After passing through a high-capacity centrifuge there is only about 5-10 per cent of original froth remaining, and this is re-absorbed in subsequent working.

Tax on Advertising. — Announcing the supplementary Budget, the Chancellor of the Exchequer stated: At present expenditure on advertisements was allowed as an expense against business profits, both from Income Tax under Schedule D and Profits Tax . . . for the future only one-half instead of the whole of advertisement expenditure would rank as an allowable expense. There would be certain exemptions from that provision, including advertisements for the export trade, which stood obviously on a special footing, and advertisements in trade and technical journals.

World Petroleum Prospects

Attempts to replace Current Deficiencies

THE extent to which petroleum from many world sources of supply has diminished from the wartime and pre-war levels is reflected by current new reports from various quarters, some of which, however, give evidence of the determined efforts being made to increase drilling and refining.

Dutch Borneo.—Production of oil in the Balik Papan field of Southern Borneo, is reported now to have reached about half the pre-war level and further substantial progress is anticipated. The Soengei Geron refinery of the Standard Vacuum was reopened last month, initial throughput being 20,000 barrels a day. Pre-war capacity of 48,000 barrels daily may be reached soon.

* * *

Canada.—Crude oil output reached a new low level in the first six months of this year with 3,587,000 barrels as compared with 3,870,000 barrels last year. Production from the Turner Valley field dropped from 3,308,000 to 2,814,000 barrels, but Alberta production rose from 562,000 to 773,000 barrels. Production of natural gas totalled 29,385,000 cu. ft., compared with 26,799,000.

* * *

Japan.—Refined oil products in Japan amounted to 1,714,000 barrels in 1945 and 1,622,000 barrels in 1946. The war-time record figure was reached in the fiscal year to the end of March, 1943, when output aggregated 16,647,000 barrels.

* * *

Norway.—It is reported that the petroleum refinery recently constructed near Bergen, Norway, to replace a war-damaged plant, has started operations.

* * *

Italy.—The Macmillan Petroleum Corporation of Los Angeles intends to start drilling in Sicily next spring. The area involved exceeds 70,000 acres. An extensive search is being carried out in Northern Italy.

* * *

Rumania.—Rumania's petroleum production of 4.26 million tons in 1946 ranks ninth of all oil-producing countries. In 1937 the production amounted to 7.15 million tons; in 1944 war damage reduced it to 3.53 million tons. In the new economic programme the monthly production is to be raised to 425,000 tons. More than half of the Rumanian petroleum exports (2,271,000 tons) last year went to Russia.

Luminescent Pigments.—The matter summarised in "Luminescent Pigments" (THE CHEMICAL AGE, November 1) was derived from BIOS Final Report No. 1455, of which the author was Mr. G. E. Hillier, of J. W. and T. A. Smith, Ltd., Maryland Road, Stratford, London, E.15.

GERMAN REPARATIONS

Thirty-Nine Chemical Plants Officially Listed

FULLER information than has hitherto been available relating to German industrial equipment for distribution as reparations is supplied in the current issue (November 15) of the *Board of Trade Journal*. In a section occupying ten pages are classified lists of plants which have been notified by the British and U.S. Commanders as being available for allocation. The data now available include brief descriptions of the actual plant, or as is usually the case in chemical installations, sections of plant which is to be released, as well as the name, location, file serial letters and number, and the Government department in London through which applications for allocations must be made.

39 Chemical Plants

Listed now are 39 chemical plants, 10 non-ferrous metal plants, 89 steel plants, 211 engineering plants and 83 war plants, those especially adapted to the manufacture of aircraft, guns, tanks, ammunition, etc. Numbers of installations for the production of chemical and allied euipment, pipelines, tauk work, boilers, circulating systems, compressors, conveyors, etc., are named in the engineering sections.

The official notification is qualified by the warning that it is possible that substitutions may be made in some cases, in which event an early announcement will be made. Otherwise, the list is a record as announced in Berlin of all the remaining plants to be made available from the two zones with the exception of plants in the aluminium, beryllium, vanadium, magnesium, synthetic oil and rubber, synthetic ammonia, and ball and roller bearing, and shipbuilding industries, which will be the subject of further announcements at a later date.

One-Fifth for U.K.

It is hoped (adds the Board of Trade statement) that the allocation of these plants will commence during the early part of 1948, and that they will be disposed of to nations by the autumn of that year. The share of the United Kingdom in the plants represents approximately one-fifth of their total value. It is impossible to say, in advance of allocation, whether any particullar plant will ultimately be allocated to the U.K.

In the winter of 1945/1946, representatives of U.K. industry visited plants in Germany for the purpose of assessing and advising production departments of their respective requirements of reparations plant. Such assessments will in many cases no longer represent industry's present needs, and in general will not serve as a guide for the compilation and entry of bids by the U.K. in respect of plants on the present list.

While full details of the equipment contained in these plants are not yet available, anyone who would be interested in securing any of the plants as a whole, or major portions thereof, is invited to express his interest in writing forthwith to the appropriate production department indicated in the schedule. A further announcement will be issued giving the final date for the submission of such expressions of interest.

Inspections

When full and up-to-date particulars are available expressions of interest may be confirmed or corrected. In certain cases, it will be possible for visits of inspection to be made prior to such confirmation or correction.

Each communication of an expression of interest should indicate very briefly the purpose for which the plant is needed and its relationship to the present production and capacity of the applicant. Inquiries for individual items of machinery and equipment located in the plants are not required at present.

Plant allocated to the U.K. will be offered for sale to ultimate users only through Government disposal channels. It will be sold at prices roughly equivalent to those ruling in the U.K. for corresponding equipment in the same second-hand condition.

Official Schedule

LISTED as "Industrial plants surplus to the bi-zonal level of industry, British Zone (North Rhine-Westphalia)" are plants or parts of plants of 17 undertakings, in the abbreviated descriptions of which, given below, a serial number (B/S/—) is quoted after the region and the administrating department is represented by the initials B.O.T. (Board of Trade, Raw Materials Division (5A), I.C. House, Millbank, London, S.W.1) or M.S. (Ministry of Supply (G5E), The Adelphi, London, W.C.2:—

North Rhine-Westphalia

A.G. FUR STICKSTOFFDUNGER, Knapsack (B/S/125): (*a*) section for the production of activated carbon (B.O.T.); (*b*) part of the section for the production of acetone from acetic acid (B.O.T.).

BLUMBERG & Co., Lintorf (B/S/126): plant for the production of pyrotechnics (M.S.).

DYNAMIT A.G., Schlebusch (B/S/127): (*a*) section for the distillation of glycerine (M.S.); (*b*) part of the section for the production of trinitrotoluene (M.S.).

DYNAMIT A.G., Troisdorf (B/S/128): (*a*) section for the production of nitropenta (B.O.T.); (*b*) section for the production of Vulcan fibre (B.O.T.); (*c*) part of the

section for the production of phenoplasts (B.O.T.); (*d*) part of the section for the production of celluloid (B.O.T.).

HENKEL & CIE. G.M.B.H., Dusseldorf (B/S/129): (*a*) part of the section for the production of soap powder (Ministry of Food, Scientific Adviser's Division, Portman Court, London, W.1); (*b*) part of the section for the distillation of glycerine (M.S.).

I.G. FARBENINDUSTRIE A.G., Dormagen (B/S/130): section for the production of Perlon U. (B.O.T.).

I.G. FARBENINDUSTRIE A.G., Elberfeld (B/S/131): (*a*) section for the production of cellulose derivatives (B.O.T.); (*b*) section for the production of miscellaneous resins (B.O.T.).

I.G. FARBENINDUSTRIE A.G., Holten (B/S/132): plant for the production of ethylene oxide and ethylene dichloride (B.O.T.).

I.G. FARBENINDUSTRIE A.G., Leverkusen (B/S/133): (*a*) section for the production of "Sulfigran" (sodium sulphide by hydrogen reduction of sodium sulphate), (B.O.T.); (*b*) section for the production of atebrin (M.S.); (*c*) section for the production of polyamides and miscellaneous resins (B.O.T.); (*d*) section for the production of hydrazine hydrate (M.S.); (*e*) part of the section for the production of activated carbon (B.O.T.); (*f*) part of the section for the nitration of toluene (M.S.).

I.G. FARBENINDUSTRIE A.G., Verdingen (B/S/134): part of the section for the production of alkydal resins (B.O.T.).

I.G. FARBENINDUSTRIE A.G., Zweckel (B/S/135): plant for the production of ethylene oxide, ethylene dichloride, polyethylene, bleaching powder (B.O.T.).

I.G. SAUERSTOFFWERK, Duisburg (B/S/136): plant for the production of liquid oxygen and bottled industrial oxygen (B.O.T.).

KABELWERK DUISBURG ABTEILUNG ZUNDERFABRIK, Mulheim (B/S/137): plant for the production of fuzes and detonators (M.S.).

OXO-GESELSCHAFT M.B.H., Oberhausen (B/S/138): plant for the production of higher aliphatic alcohols (B.O.T.).

PYROTECHNISCHE LABORATORIUM W. NORRES., Dorsten (B/S/140): plant for the production of pyrotechnics (B.O.T.).

VEREINIGTE ZUNDER AND KABELWERKE, Lage/Lippe (B/S/142): Plant for the production of fuzes (M.S.).

WECKE, FERD., NACHF., Wuppertal (B/S/143): plant for the production of pyrotechnics (B.O.T.).

Bavaria

ANORGANA, Gendorf (A/S/67): (*a*) part of section for production of chlorine and caustic soda (Na_2O), (B.O.T.); (*b*) section for production of acetaldehyde (B.O.T.); (*c*) part of section for production of glycol (B.O.T.).

DR. ALEXANDER WACKER, Burghausen (A/S/68): (*a*) part of section for production of plastics on basis of cellulose acetate (B.O.T.); (*b*) part of section for production of solvents (B.O.T.).

I. G. FARBEN, Gersthofen (A/S/69): part of section for production of wax (B.O.T.).

KOPP & CO., Munich (A/S/70): plant for production of soap products (Ministry of Food, Scientific Adviser's Division, Portman Court, London, W.1).

CHEM. WERKE V. TRANSCHE & CO., Gersthofen (A/S/71): plant for production of hydrazine hydrate (M.S.).

VEREINIGTE FLUSSPATWERKE, Stulln (A/S/72): (*a*) section for production of hydrofluoric acid (B.O.T.); (*b*) section for production of sodium fluoride (B.O.T.); (*c*) section for production of synthetic cryolite (B.O.T.); (*d*) section for production of potassium bifluoride (B.O.T.); (*e*) section for production of sodium fluoro silicate (B.O.T.).

ELECTROCHEMISCHE WERKE, Munich (A/S/73): section for production of concentrated hydrogen peroxide (M.S.).

Hesse

KALLE & CO., A.G., Wiesbaden (A/S/120): part of the section for the production of methyl, ethyl, cellulose type products (B.O.T.).

CHEM. WERKE KURT ALBERT, Wiesbaden (A/S/121): (*a*) part of the section for the production of phenoplasts (moulding powder), (B.O.T.); (*b*) part of the section for the production of artificial copals (B.O.T.).

M. KAPPUS, Offenbach (A/S/122): plant for the production of soap products (Ministry of Food, Scientific Adviser's Division, Portman Court, London, W.1).

I. G. FARBEN HOECHST, Hoechst (A/S/123): (*a*) part of the section for the production of uresin (B.O.T.); (*b*) part of the section for the production of polyvinyl acetate (B.O.T.); (*c*) section for the production of carboresin (B.O.T.); (*d*) section for the production of sulphur black (B.O.T.); (*e*) part of the section for the production of solvents (B.O.T.); (*f*) part of the section for the production of chlorinated solvents (B.O.T.); (*g*) part of the section for the production of dinitrobenzene (B.O.T.).

P. S. MOBS, Giessen/Lahn (A/S/124): two plants for the production of soap products (Ministry of Food, Scientific Adviser's Division, Portman Court, London, W.1).

ROEHM & HAAS, Darmstadt (A/S/125): section for the production of soap powder (Ministry of Food, Scientific Adviser's Division, Portman Court, London, W.1).

I. G. FARBEN SAUERSTOFFWERKE GRIESHEIM, Griesheim (A/S/126): plant for the production of industrial gases (B.O.T.).

I. G. FARBEN SAUERSTOFFWERKE, Kassel-Mittelfeld (A/S/127): plant for the production of industrial gases (B.O.T.).

Wurttemburg-Baden

DEUTSCHE PYROTECHNICS FABRIK, Cleeborn (A/S/150) plant for the production of pyrotechnics (B.O.T.).

KRAEMER & FLEMMER, Hellbronn (A/S/151): plant for the production of soap products (Ministry of Food, Scientific Adviser's Division, Portman Court, London, W.1).

SALINE LUDWIGSHALL, Bad Wimpfen (A/S/152): (*a*) plant for the production of sodium fluoride (B.O.T.); (*b*) plant for the production of aluminium fluoride (B.O.T.); (*c*) plant for the production of synthetic cryolite (M.S.).

Chemical Equipment

In a list of fifteen mechanical engineering undertakings in Hansestadt Hamburg are BARTHELS and LUEDERS, Hamburg, B/S/479; plant for the production of chemical equipment, boilers, tankwork and pipelines (M.S.); and GEB BOEHLING, Hamburg, B/S/480; plant for the production of boilers, tankwork and pipelines, organic and inorganic chemical equipment, equipment for gas and water industry and heat exchange apparatus. Included in the heavy and light engineering plants for disposal in Wurttemburg-Baden are MAHLER, Esslingen, A/S/158; plant for the production of chemical equipment (M.S.); and KODAK A.G, Einsingen, A/S/176; plant for the production of phototechnics.

Oil-Crushing in France

In *Oleagineux* for July 1947, Edouard Rastoin discusses the present position and future prospects of the French oil-crushing industry. In 1938 1,328,000 tons of oilseeds and nuts were processed; in 1944, 80,000; in 1946, 420,000, while the present annual capacity is about 700,000 tons. In two or three years this total is expected to be doubled. Under prevailing conditions extraction methods are found to give higher yields than pressing, though pressing will still be used for certain seeds; development work is proceeding, and new products from oils and fats are being rapidly introduced. The main problem is supply of raw material, for which great hopes are entertained from the new enterprises in French Africa.

The author notes the not always acceptable tendency for countries producing oilseeds, nuts, and fruit to develop their own oil-crushing industries, and to export the oil often at excessive prices.

French Dismantlings in Germany

56 I.G. Farbenindustrie Plants to Go

THE French Military Government has now drawn up the list of industrial plants to be dismantled in the French zone of Germany. The list contains 79 chemical plants which belong either directly or indirectly to the war industry or to industries whose production capacity is to be limited.

While the full list is not yet available, it has been officially stated that the dismantling programme includes 38 plants at the Ludwigshafen works of I.G. Farbenindustrie, nine of its plants at Oppau, eight at Rheinfelden, and one at Rottwell.

The French dismantling list further mentions the aluminium works at Rheinfelden, the factory of Deutsche Gold- und Silberscheideanstalt at Rheinfelden, the Otavi mine at Blumberg, the Dynamit A.G. works at Hamm, and the factory of Duerener Leichtmetallwerke at Berlin-Wittenau. By far the most important of these works are the I.G. plants at Ludwigshafen and Oppau.

The German critics of the Anglo-U.S. dismantling list for the chemical industry admit that the production capacity as a whole is not severely reduced by the loss of the plants scheduled for dismantling. Their argument so far has been that certain sections of the chemical industry will have to bear the brunt of the dismantling programme and that these include some which are very important in present conditions.

1936 Level for Plastics

It is asserted that the production of plastics will be reduced to the level of 1936, when the industry was still very young and small. Removal of solvents factories will make it impossible for Germany to produce appreciable quantities of lacquers, and it is further claimed that the output of pest control agents and fertilisers will fall below local requirements if ammonia plants are dismantled according to the published list.

The main criticism, however, is directed against the proposed dismantling of plant for the manufacture of detergents. Of the present capacity in the Anglo-U.S. zone, which is given as 406,000 metric tons annually, 212,000 tons only are said to be available, and of this plant totalling 140,000-150,000 tons is to be dismantled.

"Oxo" Plant Dismantled

The remaining plant, it is argued, would in any case be far from adequate, but it could not in practice be used fully because of transport difficulties. Concern is also expressed about the dismantling of the "Oxo" plant at Holten near Oberhausen which draws on the light diesel oil from Fischer-Tropsch synthesis plants for the manufacture of soap. As this plant was recently scheduled for re-opening, it is hoped that its inclusion in the dismantling list may be rescinded.

In this connection the information has been volunteered that detergents were previously made from Fischer-Tropsch synthetic fatty acid products by two different processes: the Mersol process developed by Badische Anilin- und Sodafabrik, and the paraffin oxidation process developed by Henkel, Maerkische Seifenindustrie and I.G. Farbenindustrie.

The latter group, handicapped by shortage of coke, has had recourse to a third process, the Oxo process of Dr. Otto Roelen, by means of which 10,000 tons of products can be obtained in the plant at Holten. The light diesel oil fraction of the Fischer-Tropsch synthesis, which is used for this process but cannot be used for the other processes, accounts for about 18 per cent of the total output of liquid products in Fischer-Tropsch plants. It is claimed that use of the Holten plant would permit distribution of the full hard soap ration in the Anglo-U.S. zone without additional supply of coke.

£20 MILLION REFINERY EXTENSION

MINISTERIAL approval has been secured for the £20 million scheme for an extension of the Agwi Petroleum Corporation's refinery at Fawley, Southampton Water. The decision, says a Government letter to the Corporation, conforms to the national interest. The effect of the scheme will be to increase the refinery's present crude-oil capacity from 600,000 tons a year to more than 3,000,000 tons, involving a rise in the labour force from 1000 to 3000, and thus making the refinery one of the largest in Europe.

LINSEED OIL PROSPECTS

ADDRESSING the Export Group of the Paint Industry in London last week, Mr. A. G. Bottomley, Secretary for Overseas Trade, said that stocks of linseed oil were considerable, and the cultivation of linseed in Britain was expected to produce appreciable results before the end of next year. He added that it could be assumed that the present allocation of linseed oil and other paint industry raw materials, would continue on the present scale.

Lacquer bases and thinners are no longer being imported; there will be increased imports of solvents.

MODERN METHODS OF TAR DISTILLATION

RECENT progress in the technology of tar distillation was reviewed in some detail at the last meeting in Manchester of the North-Western branch of the Institution of Chemical Engineers by Mr. A. L. Curtis, whose study of the subject was derived from the tar distillation plant operated by the Koppers Company.

In the Koppers installation the tar is heated to 160° C. in a coil, is dehydrated in a distillation column which also separates the most volatile constituents, and is re-heated to 360° C. before entering the pitch column from which the vapour passes in series through five columns. A portion of the oil leaving each column is returned to the previous column as reflux and the temperature at the top of each column is automatically controlled by the control of the reflux.

The process is a continuous one and superheated steam is available in any column for additional stripping. Other automatic controls contribute to the successful operation of the plant. The heat consumption is low, 1,100,000 B.Th.U. per ton of crude tar and a heat balance on the distillation is given.

The pitch is blended with oils to produce a road tar by pumping both materials simultaneously into one pipe-line. The present output is 250 tons per day and the plant capacity is 400 tons per day of tar.

Control by Analysis

The analysis of oils for naphthalene content contributes much to the control of naphthalene production. Crystallising point curves are given for naphthalene recovery from oils at different temperatures and new curves are given for a special oil and naphthalene mixture.

Good fractionating equipment is necessary to increase the naphthalene content of oils from which naphthalene is extracted. The yield of hot-pressed naphthalene from the naphthalene oil fraction has been expressed as a table. The naphthalene oil fraction is continuously solidified by means of chilling drum and the solid hot-pressed. The naphthalene is bagged one hour after the naphthalene oil enters the chilling drum.

Anthracene is obtained from the anthracene oil fraction by crystallisation in horizontal cylindrical crystallisation tanks, followed by centrifugal separation. The oil is kept well stirred and can be pumped long distances by centrifugal pumps. A reaction between anthracene and maleic anhydride is used as a means of estimating anthracene in oils in two hours. Other constituents of coal tar can be isolated in small efficient stills. The plant is well housed and particular care is paid to cleanliness.

Mr. Curtis gave further details of the plant and products of interest from the engineering viewpoint in the course of subsequent discussion. The pipe still, he said, was made of boiler tube with ends of enamelled cast steel to guard against erosion. The pumps on the distillation plant had cast iron bodies and nickel alloy impellers. Carbon was deposited in the deposition tank and was thus avoided in the pitch cooler. The naphthalene cooler was cooled by water and small crystals of naphthalene were formed, making it necessary to apply the pressure on the hot presses slowly. The phenol was separated from the cresols which occur in the naphthalene fraction. The steam consumption of the plant was 90 lb. per ton of tar.

The branch paid a silent tribute to the memory of the late Lieut-Col. E. Briggs, C.B.E., D.S.O., a former vice-chairman of the branch.

AUSTRALIAN LEAD AND ZINC

AUSTRALIAN mining companies have predicted that prices for lead and zinc will rise and remain high for some time to come. Shareholders of Broken Hill South, Ltd., have been told that world demand for lead continues to exceed supply and that this position will continue. Prices outside Australia are rising, and at the annual meeting of North Broken Hill, Ltd., which took place recently, Mr. Maurice Baillieu, chairman, said that world prices for lead are dominated by demand in the United States, which is not only the largest producer of lead but is also a big importer, and is likely to continue importing large quantities. Mr. Baillieu pointed out that Britain is buying more lead than she did before the war and he predicted that income from North Broken Hill, Ltd., would increase.

U.S. ALUMINIUM PRODUCTION

PRODUCTION of virgin aluminium in the U.S.A. in July was 47,998 short tons compared with 46,259 in the previous month, while stocks of primary aluminium rose from 73,893 short tons at the beginning of July to 78,954 at the close. The major source of raw material was Canada which supplied 603 short tons in July making a total of 14,553 short tons for the January/July period. Main U.S. customers for alloy ingot and slab, etc., during the seven-month period were the South American countries which secured 364 short tons of the 842 exported. In July, 2168 short tons of sheets, plates and strips were exported to Asiatic destinations, by far the largest market, making 9917 tons for the seven-month period.

SEPARATING FINE PARTICLES

New Selective Method Described

SOME developments in the technique of separating particles by air or gas stream, relating in this instance to aluminium or other powders of leaf or needleform structure are represented by the British patent application No. 26487/1947 in the names of Carlsfors A/B and K. G. Winquist, of Carlfors, Huskvarna, Sweden.

The patent does not disclose the actual method used in production of the aluminium or other powder, but is mainly concerned with methods of separation or classification of the powder by centrifugal air blast according to specific surface of particles.

Aluminium powder in light or porous concrete promotes evolution of hydrogen gas, or "fermentation," and the chief difficulty is to correlate the end of fermentation period with the beginning of hardening. The period of gas evolution depends large on particle size of the flakes, hitherto mainly decided by sifting. Existing methods are not wholly satisfactory, as account is not taken both of weight and extent of surface area. Fermentation time has been found to be inversely proportional to specific surface of grains or flakes, *i.e.*, ratio of area to weight. At the same time, the size of flakes must not fall below a certain minimum, otherwise pores in the concrete would be too small.

Gas Stream

The main purpose of the present invention is to divide the material into suitable fractions, according to the specific surface of particles and their weight, by use of centrifugal wind separation. Suitable apparatus includes a fan into which unsifted powder is fed from the container, and the powder together with a gas stream (presumably carbon dioxide) is blown tangentially into an annular chamber where the heavier particles and those of small specific surface are separated by centrifugal force, thrown against the walls of chamber, thence through a funnel-shaped outlet into another container.

In helical or spiral paths the gas stream with particles of large specific surface passes through a sifting device, the centre of which is connected with a pipe serving as an outlet for the gas stream mingled with sifted powder, and leading to a filter in which the gas is freed from floating particles, which fall through the bottom of the filter into the container below.

From the filter the purified gas stream passes through a pipe back to the fan. A conduit is connected at one end to the high-pressure side of the fan, and is provided with an adjustable valve leading direct to the annular chamber. Through this conduit additional gas is supplied to the chamber, thereby governing the tangential velocity of main gas stream. By adjusting this valve the sifting capacity of whole apparatus may be regulated.

Selective Separation

By this means not only are light particles separated from heavier ones, but those of small surface area are separated from larger ones. By fine regulation of the velocity or amount of air, respectively, in the two inlets of separator the desired fraction with respect to specific surface and optimum size can be obtained. The practical improvement thus achieved is illustrated by a curve where the fermentation period in minutes is plotted against hydrogen evolution in millilitres. By usual methods hitherto used 27 min. are required to reach a hydrogen evolution of 700 m/lit. By the new method only 12 minutes are needed. Moreover, the specific surface area in the second case is much greater per gramme, as necessarily is the ratio of weight to length: in the first case 1 : 37, and in the second 1 : 46.

With aluminium flake powders, the use of carbon dioxide as the inert gas eliminates or considerably reduces risk of explosion. The process is, of course, applicable to powders for other uses, including paint.

In view of the growing importance of particle size, shape, and distribution in many branches of modern industry, if the new method does all that is claimed, it should find wide application in powder technology generally. Pneumatic methods of separation are old and well known; this, however, appears to carry the technique a step further.

Caustic Soda in Brazil

The Brazilian Government has inaugurated the establishment of a National Caustic Soda Industry and has obtained a loan from the U.S. towards the cost of machinery and equipment—as well as for the payment of American experts for training Brazilian technicians in connection with the plant. The factory will be located at Cabo Frio in the State of Rio de Janeiro where the two essential raw materials, salt and lime, are found. The Federal Government will hold 54 per cent of the capital of the new company—the Cia. National de Alcalis—the remainder being subscribed by Brazilian investors.

In the Chilean Punta Arenas district oil-drilling operation at Springhill, Tierra del Fuego, has been satisfactorily completed, oil with a high petrol content having been discovered at 7400 feet.

IRON COMPOUNDS AND PHOSPHATIC FERTILISERS

TESTS WITH X-RAY POWDER DIAGRAMS

by H. W. LEHRECKE, Ph.D.

A SOLUTION was made of 100 parts of $FeCl_3.6H_2O$ in 400 parts of H_2O. This solution was added during vigorous stirring to a solution of 80 parts of diammonium phosphate in 400 parts of water. A light yellowish precipitate was formed which was washed by decantation until no chlorine was to be found in the filtrate. The precipitate was dried in a desiccator at ordinary temperature. (It is difficult to remove the last traces of free water from the precipitate.)

The product made in this way showed a weight ratio of P_2O_5 to Fe_2O_3 of 0.8877 against the theoretical 0.8876.

The X-ray powder-diagram of this compound, taken with Cr_{B-K}-radiation, did not show the slightest trace of interference (Fig. 2a). Thus the product must be regarded as really amorphous. No change in this condition could be observed during storing at normal temperature.

In order to study the influence of elevated temperature on the structure of ferric phosphate and its solubility, two samples were heated to a temperature of 75°C. during 35 and 50 days respectively. In the first case no change visible to the eye could be observed, but the X-ray powder-diagram (Fig. 2b) showed distinct reflections. This proved that crystallisation had begun.

The sample which had been heated during 50 days had gained a light whitish rose colour. From the X-ray powder-diagram (Fig. 2c) it can be seen that in this case the crystallisation had become still stronger than in the case of the 35-day sample.

The reflections in these two diagrams of the heated amorphous modification of ferric phosphate are identical with the reflections obtained from the directly precipitated crystalline form of this composition (Fig. 2d). In this case the reflections are more diffuse because of the very small size of the crystallites.

Simultaneously with the transformation of the amorphous form of ferric phosphate into the crystalline one by elevated temperature, a considerable decrease of its citrate-solubility had occurred. This solubility was determined with the so-called Petermann solution, an ammoniacal solution of citrate of ammonia (23 per cent, S.G. 1.081, $pH = 9.1$), at 20°C. and in accordance with the recognised procedure.

The solubility of a sample of amorphous ferric phosphate was found to be as high as 47.2 g. per 100 cc. of the above-named solution of citrate of ammonia. The solution obtained had a deep brown colour and turned after some days into a gel (probably $Fe(OH)_3$).

Only 8.0 g. of the sample of amorphous ferric phosphate which had been heated to 75°C. during 35 days and thereupon proved to be partly crystallised, were soluble per 100 cc. of Petermann's solution of citrate of ammonia. This solubility decreased still more, *i.e.*, to only 0.09 ferric phosphate per 100 cc., when the sample of amorphous ferric phosphate, which had been heated to 75°C. during 50 days and thereupon showed intensive crystallisation, was treated with Petermann's solution of citrate of ammonia.

Crystalline Ferric Phosphate

A solution was made of 72.15 g. $FeCl_3.6H_2O$ in 100 g. water and 29.42 g. phosphoric acid (89 per cent H_3PO_4) were added to the solution. This was evaporated until it became syrupy and diluted with water in a proportion of 1 : 1. A light rose-coloured precipitate was formed during the dilution, filtered off, washed with water and dried at 40°C.

The product obtained showed the following composition :—

	Found	Theoretical
P_2O_5	37.97%	37.97%
Fe_2O_3	42.72%	42.78%
Proportion $P_2O_5 : Fe_2O_3$	0.8888	0.8876

The X-ray power diagram (Fig. 2d) shows the same interferences as the crystalline ferric phosphate, which was obtained by heating the amorphous modification (Fig. 2b and c), but the lines are more diffuse, resulting in the disappearance of the weakest ones. From this it must be concluded that the crystallites of the directly precipitated ferric phosphate are smaller than those obtained by the slow transformation of the amorphous modification to the crystalline form.

This is confirmed by the figures obtained for the solubility of the directly precipitated phosphate in Petermann's solution of citrate of ammonia. This was found to amount to 0.1463 g. per 100 cc. solution at 20°C. against 0.09 g. for the transformed amorphous modification. By the thermodynamical calculation of W. Ostwald[8] it has been shown that the solubility of a substance increases with decreasing size of its particles, if these become less than 10^{-4} cm.

However, the solubility of the crystalline

ferric phosphate obtained directly as described is of the same low order as that of the crystalline form obtained by heating the amorphous modification.

For practical purposes it can therefore be stated that the crystalline forms of iron-triphosphate are insoluble in an ammoniacal solution of citrate of ammonia.

Diphosphatoferric Acid

The following method was used in order to produce diphosphatoferric acid with 2.5 molecules of water:—

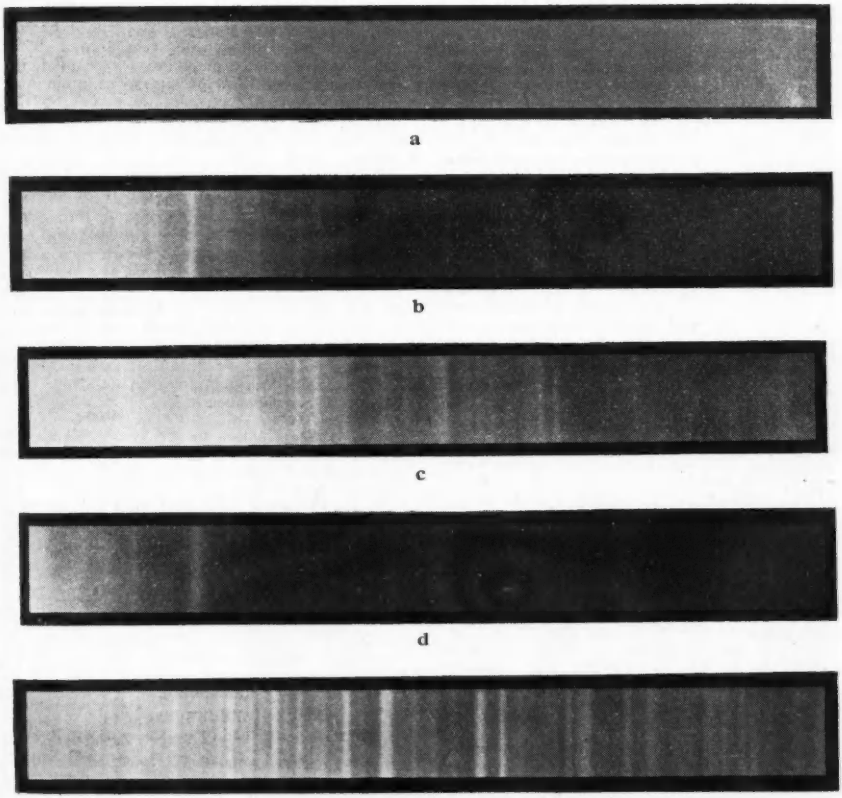
24 g. amorphous $FePO_4.2H_2O$ were dissolved at 75°C. in 100 g. phosphoric acid containing 48 per cent H_3PO_4. The solution was kept at 75°C. during several hours. A rose-coloured, crystalline precipitate was formed, which was filtered off, washed and dried. Its composition was as follows:—

	Found	Theoretical $H_3[Fe(PO_4)_2].2.5H_2O$
P_2O_5	48.63%	48.32%
Fe_2O_3	27.65%	27.17%
Proportion by weight $P_2O_5 : Fe_2O_3$	1.759	1.778

A certain excess of Fe and a still smaller one of P_2O_5 was present, probably caused by the action of the washing water on the film of mother liquor on the surface of the crystals. Because of its smallness, this surplus could be neglected during the following work.

The X-ray powder-diagram of the diphosphatoferric acid produced in this way is shown in Fig. 2e. It consists of a great number of interferences, which proves a complicated crystal-structure of the complex compound. The diagram is quite different from those obtained for crystalline $FePO_4$.

(*Continued overleaf*)



a b c d e

Fig. 2

NATIONAL FOUNDRY COLLEGE

THE National Foundry College, which will open its first session on January 5 at Wolverhampton, is the lineal successor, with widened scope, of the National Foundry College, which closed at the outbreak of war. Its board of governors, nominated by the Minister of Education, represents a number of interested bodies in industry and education under the chairmanship of Mr. Randall G. Hosking. The college will be housed in, and work closely in conjunction with, the Wolverhampton and Staffordshire Technical College.

The board is charged with providing national facilities for foundry education and research, in the form of full-time courses, vacation courses, refresher courses, and the like, and also for providing regional and local facilities for full-time, part-time day and evening courses, covering the whole range of foundry education. Its first task will be the re-establishment of the full-time diploma course which was the main feature of the British Foundry School, during 1925-1939.

40-Week Course

This course will normally run for an academic year of 40 weeks from September to July. It will cover the whole of the foundry industry, ferrous and non-ferrous, including grey, white and chilled iron castings, malleable castings, steel castings, and castings in all non-ferrous metals, such as alloys of copper, tin, zinc, nickel, aluminium and magnesium. The diploma awarded to successful students will be endorsed by the Ministry of Education.

A minimum of one year's practical experience in at least one branch of the industry will be required of candidates, for whom there is no age limit, together with Higher National Certificate, or a university degree, preferably in metallurgy or engineering, or a grade of membership obtained by examination of a professional institution in engineering, metallurgy or chemistry. It is intended to invite nationally known experts in the industry to participate in the work of the college.

Principal Appointed

The Minister of Education, on the recommendation of the board of governors, has appointed Mr. J. Bamford, B.Sc., who was in charge of the British Foundry School during 1935-39, and who has since held important managerial appointments in the industry, to be the college principal.

The prospectus and the curriculum with form of application for admission can be obtained from the Head of the National Foundry College, Technical College, Wilfruna Street, Wolverhampton.

COST OF SHORTAGES

ADDRESSING the 18th ordinary general meeting of the Imperial Smelting Corporation, Ltd., in London last week, Mr. J. R. Govett, the chairman, revealed that last winter's fuel shortage caused a complete 3-week stoppage of lithopone manufacture at the Widnes works. An additional lithopone plant which the company had under construction, and had hoped to have ready for operation soon, had been delayed owing to lack of steel. Last year's production of lithopone, the distribution of which had been officially controlled, had been 75 per cent absorbed by the home paint trade, and the balance by other trades and export. As a result of improved efficiency in the operation of vertical retort plant, zinc production had exceeded that of 1946, while sulphuric acid production had been the highest ever.

IRON COMPOUNDS (*Continued from page 673*)

It thus appears that $FePO_4$ cannot be an iron salt of diphosphatoferric acid. The solubility of the diphosphatoferric acid in Petermann's solution of citrate of ammonia amounted to 7.272 g. per 100 cc. at 20°C. Consequently, it is considerably more soluble than the crystalline form of ferric phosphate.

Table 1 gives a summary of the solubilities in Petermann's solution of citrate of ammonia found for the compounds of iron and phosphoric acid investigated in this work.

TABLE 1.

Composition	Solubility in 100 cc. of Petermann's ammoniacal solution of citrate of ammonia at 20°C.
Amorphous ferric phosphate, $FePO_4$...	47.20 g.
Crystalline ferric phosphate, formed by crystallisation of amorphous $FePO_4$	0.09 g.
Crystalline ferric phosphate, directly precipitated	0.146 g.
Diphosphatoferric acid, $H_3[Fe(PO_4).2.5H_2O$	7.272 g.

From this it can be stated, that only amorphous $FePO_4$ and $H_3[Fe(PO_4)_2].2.5H_2O$ are soluble in a practical sense. The crystalline forms of $FePO_4$, however, must be considered as insoluble.

Furthermore, it must be concluded from these results that a decrease of the citrate-solubility of the phosphoric acid in superphosphate is a consequence of the transformation of diphosphatoferric acid into crystalline ferric phosphate.

REFERENCES

8. W. Ostwald, Zeitschr. Phys. Chem. **34**, 495 (1900)
9. See A. Bailer, *loc.cit.*
10. See Carter and Hartshorne, *loc.cit.* p.2230.
11. Sanfourche and Focet, Bull. Soc. Chim., **53**, p.1517-22 (1933). Marshall and Hill, Ind. Eng. Chem., **32**, p.1227 (1940).

(*To be continued*)

American Chemical Notebook

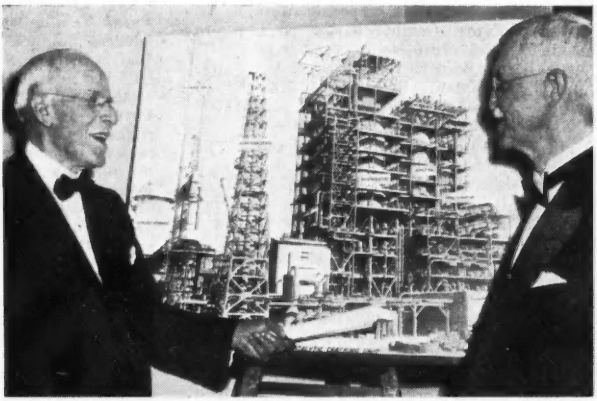
From Our New York Correspondent

FOR developing with his associates the first commercially successful cracking process to make more gasoline out of crude oil and thereby becoming the father of modern petroleum refining technology, Dr. William M. Burton, of Cambridge, Massachusetts, retired former president of the Standard Oil Company (Indiana), of Chicago, was last week awarded the American Petroleum Institute Gold Medal for Distinguished Achievement. Patented January 7, 1913, following development in the laboratory at Indiana of Standard's Whiting, Indiana, refinery, the Burton process more than doubled the potential yield of gasoline available from crude oil to meet the vast demand for gasoline which the age of the automobile was to create. The award cited Burton's pioneer work in demonstrating the value of laboratory research and testing and describes him as " the progenitor of modern refining technology. You developed," the citation continued, " the first commercially successful cracking process, more than doubling the potential yield of gasoline available from crude oil. This process marked the industry's advance from merely separating and purifying the natural ingredients of petroleum to altering its chemical composition so as to produce tailor-made molecules for specific purposes." Previous honours awarded to Dr. Burton include the Willard Gibbs medal of the American Chemical Society in 1918, and the Perkin medal of the Society of Chemical Industry in 1922. The latter award is the highest recognition attainable in the United States for work on applied chemistry.

The U.S. chemical industry may succeed in bettering its highest wartime production, if the present output is maintained throughout the fourth quarter. Demand for chemicals continues to outstrip supply, and last year the industry produced nearly 35 million tons of organic and inorganic chemicals. This year's production of industrial chemicals has reached a level of 329 per cent above the 1935-39 average compared with the wartime peak of 312 per cent. Meanwhile, financial statements covering the first nine months of 1947 indicate that the industry is continuing to earn handsome profits. Future prospects are favourable since the United States has largely taken over the markets formerly supplied by the German chemical industry—it is estimated that U.S. chemical exports in 1947 may total $700 millions, an all-time record. The high volume of production can be largely explained by the fact that the industry has been investing large amounts of capital in new buildings and equipment. During the next two years huge amounts will be spent in this direction with Du Pont alone intending to spend $300 millions.

* * *

Professor Benjamin Harrow, chairman of the department of chemistry at the City College of New York, has been elected to the British Royal Society of Arts, it was announced by the college this week. He is the second faculty member of the college to have received the honour this year. The first was Prof. Albert P. d'Andrea, of the department of art.



Dr. W. Burton (left) and Dr. Robert E. Humphreys, who were the guests of honour of the British Newcomen Society in Chicago last year, when the Standard Oil Co. catalytic cracking plant (in the photograph) was opened in Indiana

PARLIAMENTARY TOPICS

Imports of Scientific Books.—Owing to the large dollar expenditure involved it was necessary last September to revoke the Open General Licence for import of non-fiction books. Under the new arrangements licences are granted to pre-war importers of learned scientific and technical books in English to bring in up to 100 per cent by value of their pre-war imports. I am, however, prepared to consider the issue of licences for limited additional imports of technical and scientific books in English from certain European countries. Similar books in foreign languages from non-English speaking countries are licensed freely.—Mr. H. Wilson.

Copper Sulphate Sales.—Exports of copper sulphate, which have been running during the first nine months of this year at an annual rate equivalent to approximately 90 per cent by volume of pre-war exports, have been limited by the import restrictions in force in some of our principal markets. My Department will continue to take all practical steps to press the Governments concerned to relax those restrictions to enable the United Kingdom product to compete on equal terms with those of other suppliers. I am glad to be able to announce that, at the recent meeting of the Anglo-French Economic Committee, the French Government agreed to issue import licences for a substantial quantity of copper sulphate from this country. —Mr. H. Wilson.

Questionnaire to Scientists.—The questionnaire form which the Ministry of Labour despatched to about 160,000 British scientists on October 27 was undertaken at the request of the Advisory Council on Scientific Policy in order to obtain information about scientific manpower here. The paper involved weighed about 16 cwt. and the cost of printing was £88.—Mr. Isaacs.

Iron Ore Subsidies.—Recent subsidies to offset abnormal freight charges on iron ore since, April 1, 1946, to September 30, 1947, have been: Soft currency areas, £5,500,000 (5,750,000 tons); Sweden, £2,500,000 (3 million tons); Newfoundland, £1,700,000 (1,175,000 tons).—Mr. G. R. Strauss.

Creosote-Pitch Subsidy Withdrawn.—The maximum delivered price of creosote-pitch mixture was increased by 30s. per ton on October 1—an increase of 27.8 to 31.7 per cent—reflecting the increase on September 1 of 35s. per ton in the price of petroleum heavy fuel oil. The subsidy of 16s. 8d. per ton to creosote-pitch producers was withdrawn.—Mr. H. T. Gaitskell.

Seaweed Research.—Seaweed is being collected by crofters organised by the Scottish Seaweed Research Association, which is also arranging its sale; a private concern is also engaged in this work. Gathering has been in progress for the past three years, and research is continuing with a view to securing greater quantities.—Mr. Woodburn.

16,000 Whales.—The internationally agreed total of 16,000 blue whales which British whaling fleets may kill in the Antarctic during the current whaling season will not be exceeded. A catch of the size should not endanger future supplies, and experts had taken the view that the total should be raised, in view of the extreme shortage of oils and fats.—Mr. J. Strachey.

Imported Salt.—Imports of salt (from Spain) are necessary because the output of course salt in this country is not sufficient, particularly for fish curing and snow clearing.—Mr. H. Wilson.

THE DALTON BUDGET

THE Dalton Budget made no attempt to deal with wages, work, output and all those major issues now blazoned on the hoardings of the country in the form of threats, appeals and targets. That failure —writes Sir Ernest Benn—transcends in importance any of the alterations in the details of taxation.

For the moment the Stock Exchange is on the horns of a most difficult dilemma. Dr. Dalton's affection for cheap money which colours the whole of the Budget was an inflationary influence and put up the prices of industrial stocks and shares in spite of heavier taxation. The arrival of Sir Stafford Cripps with his preference for austerity and deflation—a much more healthy point of view—may very well result in a general fall in Stock Exchange values.

Still Bankrupt

The Budget does nothing whatever towards helping to solve the difficulty of an adverse balance in our overseas payments. The reduction of a debit of £700,000,000 to half the figure still leaves us in the position of the bankrupt, an unhappy position for a buyer; while because no steps are taken to reduce our costs at home, we still suffer serious handicaps as a seller. In this connection the flat refusal to reduce Government expenditure, except in regard to the means of defence, gives grounds for the gravest apprehensions.

The Budget bears all over it the mark of the T.U.C. which is rapidly becoming the centre of power. Had Mr. Dalton plucked up the courage of a Joseph Chamberlain, who won considerable popularity by the bold, frank and perfectly truthful statement "Your food will cost you more," he would have served the true interests of the nation better.

International Awards for English Scientists

Two Nobel Prizes

FOR the first time in 43 years Nobel prizes in chemistry and physics were last week awarded simultaneously to English scientists. The recipients were Sir Robert Robinson, president of the Royal Society and Waynflete Professor of Chemistry, Oxford University, and Sir Edward Appleton, principal of the Department of Scientific and Industrial Research.

Left: Sir Robert Robinson and, right: Sir Edward Appleton

In addition to the signal honour represented by the international recognition of their pre-eminence in two fields of research, each receives the customary £8000 award from the foundation in Stockholm created by the late Sir Alfred Nobel.

Chemistry of Plant Life

The award to Sir Robert Robinson recognises his great contribution to fundamental research in organic chemistry, latterly with penicillins. Practically all his work for many years has been directly concerned with the biologically useful substances. An important sphere of his investigations was the identification of the chemical structure of complex compounds of vegetable origin and tracing the steps by which they were built up by natural processes. One of his more noteworthy studies has been of the formation in plants of alkaloids, such as morphine and strychnine and of their structure, in which his contributions are of fundamental value.

Among his many achievements in biochemistry was his synthesis with Prof. Dodds of silbesterol, which is an important factor in combating cancer of certain kinds. Equally fundamental were the results of much of his work in theoretical organic chemistry dealing with the electronic aspect of chemical combination.

The Nobel award comes as a fitting culmination of a series of honours by which Sir Robert's work has been recognised in the past few years. The Royal Society in 1942 gave him its highest award, the Copley Medal, and he is a former president of the Chemical Society. The series of honours bestowed upon him this year testify how widespread is the recognition of his achievement. They include: in March the Franklyn Medal, highest award of the American Franklyn Institute, for his investigations of pyrimidine analogues and their reaction to vitamin B; in May election as *correspondant* of the Chemistry Section of the Paris Academy of Sciences and as a member of the Royal Norwegian Academy of Sciences; in May the Albert Medal, highest award of the Royal Society of Arts "for outstanding contributions to the advancement of organic chemistry."

The "Appleton Layer"

Sir Edward Appleton, head of the D.S.I.R. since 1939, whose Nobel award recognises his contribution "in exploring the ionsphere—the electrically conductive strata in the upper atmosphere of the earth," has been foremost since the outset of his scientific career in pioneer studies of radio wave behaviour, and latterly in the associated subjects of solar radiation and radar. His investigations established the existence of electrified layers in the upper atmosphere, which were matters of conjecture, and in particular of the so-called "Appleton layer.' These layers of electrically charged particles play an essential part in making possible wireless communication between distant stations.

Rising Coal Output

Target May Be Reached

COAL output in the U.K. last week reached 4,258,200 tons, thus continuing the upward trend of recent weeks following the introduction of overtime in the mines. A statement has been circulated to the industry—it has been signed by Lord Hyndley, Coal Board chairman, and Mr. Bowman and Mr. Horner, N.U.M. officials—to the effect that only 27,700,000 tons are required to reach the Government's target of 200 millions. Workers are urged—"let us go flat out."

Miners' Wages Increase

At a meeting between the National Coal Board and the National Union of Mineworkers last week-end—the Board had offered an additional 10s. per week in response to the Union's demand for 20s.—it was agreed that underground workers will be recommended to accept a weekly increase of 15s. per week, and surface workers 10s. per week. These increases, and related matters discussed and agreed were to be confirmed by the delegate conference of the Union, and the new rates are intended to take effect retrospectively from November 1.

ROCKET EXPLOSION

AN explosion occurred last week at a Ministry of Supply experimental station, Westcott, near Aylesbury, Bucks., where work is being undertaken in connection with rocket-assisted aircraft take-off. Three research workers—among whom was Dr. J. Schmidt, a leading German scientist—were killed, and eleven injured.

The incident, which is reported to have been caused by the discharge from one rocket prematurely exploding another, occurred despite the fullest observance of safety precautions. An official inquiry into the cause of the explosion opened on Monday last, and is expected to last a month.

QUININE PRODUCTION RECOVERY

REPORTS regarding the state of Batavian cinchona plantations and quinine salt output are reassuring. Ninety per cent of the Java plantations are in Dutch hands. There has been an abnormal increase in the annual production of cinchona, and quinine has been exported since the capitulation of Japan; the productive capacity of the area appears to be very considerable. The Bandoeng quinine factory has recommenced small-scale operations. Interested organisations have had consulations with the Batavian Government to determine the best methods of recapturing those markets that during the war had to take synthetic antimalarials.

Next Week's Events

SATURDAY, NOVEMBER 22

Society of Chemical Industry and Royal Institute of Chemistry (South Wales Section). Britannic House, Llandarcy, near Swansea, 2.30 p.m. A discussion on "The Chemist in Industry" to be opened by R. B. Southall.

MONDAY, NOVEMBER 24

Royal Statistical Society (Sheffield Group). Room B1, Department of Mechanical Engineering, The University, St. George's Square, Sheffield, 1, 6.30 p.m. Mr. C. F. Turner: "Examinations Examined."

Institute of Fuel. Lecture Theatre, Radiant House, Bold Street, Liverpool, 2.30 p.m. Dr. A. C. Maries: "The Coal Resources of the Country."

TUESDAY, NOVEMBER 25

Society of Public Analysts (Physical Methods Group). Rooms of the Chemical Society, Burlington House, Piccadilly, W.1, 6.0 p.m. Annual General Meeting, 6.30 p.m. Mr. B. S. Cooper: "The Electron Microscope."

Society of Instrument Technology. Royal Society of Tropical Medicine and Hygiene, Manson House, Portland Place, W.1, 7 p.m. D. Edmundson: "Electronic Developments in Instrumentation."

WEDNESDAY, NOVEMBER 26

Irish Chemical Association and the Royal Institute of Chemistry (Dublin Section). Chemical Department, University College, Dublin, 7.30 p.m. Dr. T. E. Nevin: "The Experimental Approach to the Problem of Nuclear Forces."

Society of Chemical Industry (Northern Ireland Section). Agriculture Lecture Theatre, Elmwood Avenue, Belfast, 7.30 p.m. Mr. H. W. Cremer: "Water—a National Asset." Food Group. Burlington House, Piccadilly, W.1, 6.15 p.m. J. M. Shewan and E. P. Sidaway: "Biological Stability of Processed Fish and Manufactured Fish Products."

Manchester Metallurgical Society. Engineers' Club, Manchester, 6.30 p.m. E. W. Colbeck: "Some Metallurgical Problems in the Field of Atomic Energy."

Institute of Welding. The Connaught Rooms, Great Queen Street, W.C.1, 12.30 p.m. Luncheon.

THURSDAY, NOVEMBER 27

Society of Dyers and Colourists (West Riding Section). Great Northern Victoria Hotel, Bradford, 7.15 p.m. Dr. P. Schulman: "Emulsions—Oil and Water Dispersal Mediums."

Royal Institute of Chemistry (London and S.E. Counties Section). Public Library, William Street, Slough, 7.15 p.m. Dr. A. H. Lewis: "Some Aspects of Chemistry in Relation to Agriculture." Manchester and District Section. The Lecture Hall, Albert Hall, Peter Street, Manchester, 7 p.m. Dr. D. T. A. Townend: "Chemistry and Fuel." (Fourth Dalton Lecture). Liverpool and N.W. Section. Liverpool, 7 p.m. Mr. G. A. Glister "Penicillin." East Midlands Section. Technical College, Shakespeare Street, Nottingham, 7.15 p.m. Dr. S. J. Folley: "Biology of Lactation."

FRIDAY, NOVEMBER 28

Society of Chemical Industry (Newcastle Section). King's College, Newcastle-upon-Tyne, 6.30 p.m. Dr. H. H. Hodgson: "Studies in Diazo Chemistry with a Criticism of the Free Radicle Hypothesis."

British Association of Chemists (Scottish Section). St. Enoch Station Hotel, Glasgow, 7 p.m. Mr. N. Sheldon: "Economic Security in the Chemical Profession."

Technical Publications

THE ten years that have passed since Plant Protection, Ltd., came into existence have witnessed so many advances in scientific inquiry that those concerned with agriculture are apt to be overlooked. The war necessitated a complete overhaul of agricultural methods, fertilisers and insecticides in particular being subject to intensive research and development. Plant Protection, Ltd., can claim to have contributed much to that development, some aspects of which are touched on in the 20 pp. booklet "Science in the Service of Agriculture," which Plant Protection has just issued in attractive form decorated by a number of very pleasant engravings.

* * *

Full description and illustrations of the new laboratory apparatus which J. W. Towers and Co., Ltd., exhibited at the B.I.F., are now provided in the latest publication of "Towers Laboratory News." Among these are the new semi-micro balances, humidity cabinet, universal electric oven, vibro shaker, time switch and simmerstat units, the all-glass water still and Lablox support frames. Another link with the B.I.F. is provided by the electric heating mantles (THE CHEMICAL AGE October 25), the production of which was stimulated by many requests for the type of apparatus received at the Fair.

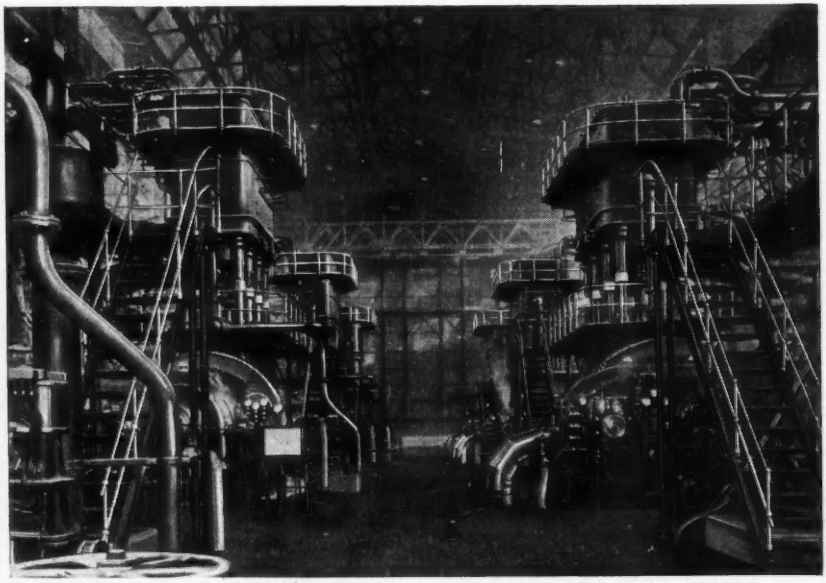
* * *

"Brass and Copper" is the title of a 250-pp. catalogue of Downs-Smith Company, New York, which derives an international value from the fact that it contains numerous tables of standards, specifications, weights, terminology, covering the physical properties, tolerances, and other requirements of copper and its alloys for sheets, rods and bars, wire, tubes, and tubing, hardware, and all industrial fittings. A comprehensive data section supplies some useful information for industry.

* * *

The latest addition to literature published by A. Gallenkamp & Co., Ltd.—Publication No. 510, October, 1947, announces three new-design laboratory furnaces, viz.: 5756 low voltage tube furnace; 5770 silicon carbide element tube furnaces; and 19875-19875/1 muffle furnace.

(*Continued overleaf*)



Chemical engineering on the grand scale, represented by a compressor plant for chemical industry recently installed by Peter Brotherhood, Ltd.

CHEMICAL OUTPUT IN JAPAN

ACCORDING to Report No. 22 (June) of Non-Military Activities in Japan, issued by the Supreme Commander for the Allied Powers, production of basic heavy chemicals continued at about the same level as in the previous month, the production index (in per cent of estimated requirements for a balanced economy) standing at 44, against 43 in May. The largest decline took place in the manufacture of finer types of dyes and their intermediates. On the other hand, calcium superphosphate production increased by 18 per cent to 67,340 metric tons, reflecting the temporary availability of pyrites. Ammonium sulphate production, however, decreased in June by 11 per cent to 67,429 metric tons as a result of lower electricity supplies and the need to close down work for repairs. A seasonal increase in the production of carbide made possible a post-war record output almost 25,000 metric tons of cyanamide—nine per cent above the May figure.

There was a decline in the output of sulphuric acid from 129,924 metric tons to 122,755 metric tons, but output of nitric acid rose to 770 metric tons against slightly more than 600 metric tons in the previous month.

There was a general decline in the sodium industries owing to lower coal allocations. Caustic soda output aggregated 4130 metric tons, of which 3761 metric tons were made by the electrolytic process. This figure compares with a peak of over 10,000 metric tons electrolytic soda manufactured in 1940. Common salt production was little changed at about 9000 metric tons, comparing about 53,000 metric tons in 1939. Other results in June included benzene from 53 to 607 and dyestuffs, 128 to 217.

TECHNICAL PUBLICATIONS (*cont. from overleaf*)

A useful gesture towards facilitating international business is the inclusion in the current issue of the catalogue of the Farrar Boilerworks, Ltd., of a miniature French-Spanish-English dictionary of technical terms descriptive of various items of essential plant. Equally useful for overseas buyers are the many good illustrations of large-scale boilers and pressure vessels, elevators, and bagging machines.

* * *

According to a recent U.S. estimate, about 10 per cent per year of newly cut timber replaces wood decayed in use. In this country the figure may be even higher because any rot in buildings has greatly increased as a result of the wartime priority calls on timber—a situation that has even now not vastly altered. In the prevailing scarcity, therefore, "Decay of Timber and its Prevention," published for the D.S.I.R. by H.M.S.O., price 13s., post free, makes a welcome and timely appearance.

* * *

A 78-page publication that has just made its 50th annual appearance is "The Soap Makers' Directory" to which has been appended a list of candle makers forming a useful and up-to-date guide.

* * *

"Rhodium—Engineering Properties and Uses" is the title of an illustrated 6-page pamphlet just published by Johnson, Matthey & Co., Ltd. One of the six metals of the platinum group, all of which have high-melting properties, rhodium is of particular interest to chemical manufacturers having high resistance to chemical attack.

For more than 200 years crucible steel from Sheffield has been the substance from which fine tools have been made for use all over the world. And so versatile is crucible steel that it has gradually been applied to purposes almost without number. The importance of the material makes it worthy of the interesting monograph devoted to it, which has now been issued in an attractive "pocket edition" by John Vesey & Sons, Ltd., Sheffield.

* * *

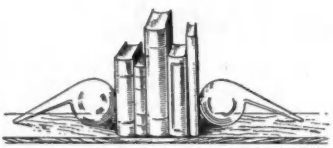
Murex, Ltd., has published a new edition of the booklet "Standard Specifications and Typical Analyses—Metals, Metallic Alloys and Carbides," which in the past has been widely used for reference by users of ferro alloys and pure metals, metal powders and metallic carbides. It has now been brought up-to-date by the addition of new products.

* * *

The latest "Ciba Review" (No. 61) fully maintains the tradition set by its predecessors of presenting an informative and graceful study of one or another branch of craftmanship in which to-day dyes perform an essential function. The subject on this occasion is gloves, and the record presented of these, from the Middle Ages to the 18th forms a unique contribution of permanent interest.

* * *

A 72-page catalogue issued by Driver-Harris Company, of Harrison, N.J., describes a number of heat- and corrosion-resisting alloys, and provides a useful reference book for the metallurgist, engineer and designer, as well as for the manufacturer who employs such materials in any of his processes or products. Information and specifications are given with regard to properties, applications, life expectancy, and current temperature characteristics.



A CHEMIST'S BOOKSHELF

Chimie Organique. By A. Kirrmann, Paris. Collection Armand Collin, 1947. Two volumes 220 and 195 pp. Each 100 fr.

The book comprises two volumes, of which the first deals with general organic chemistry, its main questions and theoretical problems, the second with its simple functions, exposing the fundamental bases of descriptive organic chemistry. Very few books in French are available in such a short and yet concise and popular form. The author, who is Professor of the University of Strasbourg, has obviously utilised his academic experiences and thus the two books follow a well designed and well executed scheme and the student who works through them conscientiously will not only have attained a good grasp of the main principles of elementary organic chemistry, but will be well prepared for further studies. Twenty-six figures and an exhaustive list of references and of bibliographic and monographic sources provide great help to such further studies. A third volume, dealing with complex functions, is to follow.

The Methods of Cellulose Chemistry. By Charles Dorée. Chapman and Hall, London. Pp.X + 543. 42s.

The experimental investigation of cellulose in its various aspects—as a chemical substance, as a structural colloidal unit and as a primary constituent of plant cells—necessarily involves specialised methods. These methods, which have been gradually evolved during the last fifty years, are described in a wide literature which includes the standard journals devoted to chemistry, physics, botany and biochemistry, and on the technical side those dealing with textiles, dyeing and colloids. There are, in addition, the publications of institutes and conferences concerned with various aspects of cellulose research. Some of the methods, in more or less detail, have found their way into the text-books on cellulose which have appeared in recent years, but it is nevertheless often difficult for the student, who is commencing work on cellulose, to find easily the experimental details he requires. The present book, compiled from notes made for the author's own students, will assist in removing this difficulty. It should prove useful both to the student about to undertake research in the wide field offered by cellulose and the substances associated with it in the plant world, and also to workers in laboratories controlling and investigating the manufacture of cellulose products.

A Rational Approach to Chemical Principles. By J. A. Cranston. London: Blackie & Son Limited, 1947, pp. VII + 211, 8s. 6d.

This book abandons the historical approach to chemistry in favour of a rational one. The physicist's atom is the starting point. From this, the fundamental laws of chemistry, the concepts of valency, the reactivities of the various elements and the ionic hypothesis all emerge in a rational way. Without entirely sacrificing contacts with the history of chemical science, the book explains the modern view in a manner that will be easily understood by the average student. The text is dealt with in five parts, entitled: The Structure of Matter; The States of Matter; Chemical Combination; Electrically-Charged Atoms and Chemical Equilibrium. An abundant number of figures and tables as well as 70 problems (with answers) make the book a very useful manual for teachers and students of modern chemistry.

Thorpe's Dictionary

We have been asked to make it clear that in Vol. VIII of this book (THE CHEMICAL AGE, August 23) two very comprehensive chapters on nitrogen were provided by J. R. Partington, M.B.E., D.Sc., Professor of Chemistry in the University of London (Queen Mary College), *viz.*: Nitrogen (pp. 497-543) and Nitrogen, Atmospheric Utilisation of (pp. 544-582).

"Electroplating"

A new monthly technical publication, whose general appearance, subject matter and lay-out, should appeal to users and manufacturers of metal finishes, *Electroplating*, has now made its promised appearance. Featured in this, its first issue, is the first instalment of "Metallography of Electrodeposited Surfaces" by Dr. A. T. Steer, research metallurgist, of the Rover Company. The liberal allowance of 40 editorial pages includes a substantial account of the Third International Conference on Electrodeposition held last September. The patents section displays a useful tendency to comprehensive description.

Home News Items

Directorate of Mica.—The address of the Directorate of Mica (Board of Trade) is now: 23 Buckingham Gate, Westminster, London, S.W.1. (Tel. No. VICtoria 7503).

Shell-Mex Explosion.—A serious explosion which occurred at the oil-washing and filling sheds of the Shell-Mex installations, Old Trafford, Manchester, on Saturday last, resulted in serious injuries to five employees. Damage was caused to filters and electric motors.

Purchase Tax on Drugs.—The British Medical Association has sent a protest to the Ministry of Health against the application of the recently increased purchase tax to many classes of drugs, many of which are in constant use. The increase, the B.M.A. points out, is bound to be reflected in increased cost of medical service.

Oil and Colour Chemists' Dinner-Dance.—Consequent upon the Ministry of Food's Meal Restriction Order, the Bristol section of the Oil and Colour Chemists' Association has cancelled its plans for this year's dinner-dance, and will hold instead a running buffet and dance. Since most members have lost their petrol ration, transport is to be arranged.

Rubber Industry Work Hours.—Agreement on a forty-five-hour week, reached by the National Joint Industrial Council for the rubber-manufacturing industry, will take effect from the first full pay period after December 7. For the present, however, the council recommends no general reduction in actual working hours. Hours of work in each factory will be decided locally.

Pension Scheme for Chemical Works.—A contributory pensions scheme for all adult employees of British Glues & Chemicals, Ltd., and associated companies (Croid Ltd., B. Young & Co., Ltd., Calfos Ltd., Standard Soap Co., Ltd., Personality Beauty Products, Ltd., and O. Murray & Co., Ltd.), comes into operation this month. The fund which embraces all employees over 21 according to their years of service has received an initial contribution of £50,000 from the company.

U.K. Machinery for Shell.—From May 1 to September 30, the Shell Petroleum Co., Ltd., placed orders for oil industry equipment worth £874,000 with 11 Yorkshire firms, and in the last 2½ years there has been a steady rise in orders placed in Yorkshire. Before the war, America had a virtual monopoly of the supply of oil machinery throughout the world. In the year ended June 30, 1946, Shell contracts with Yorkshire firms amounted to £1,250,000.

Strike Settled.—An agreement with the factory management for full recognition of their union has ended the eight weeks' strike of 26 employees of Dent and Co., and Johnson, scientific instrument makers, Lipwood, Renfrewshire. The men returned to work on November 17.

Another Fire at Brotherton's.—A tar-storage tank which exploded at Brotherton's tar distillery, Litherland, near Liverpool, on Monday last, started a large fire—the second within a week—which destroyed 1000 gals. of tar. The explosion is believed to have been caused by a spark igniting vaporised tar in the tank concerned.

£100 Prize in Welding.—The Council of the Institute of Welding has accepted the offer of the British Oxygen Co., Ltd., to provide a prize of £100 a year for three years, to be known as the B.O.C. Welding Prize; it is to be awarded annually for a paper submitted by a member of the Institute on some aspect of gas welding. The terms of the competition will be announced shortly.

U.K./Eire Exchange Agreement.—A Government announcement last week stated that an agreement has been reached with Eire whereby that country will receive "a substantial additional quantity of coal" next year together with certain raw materials and machinery, as well as 15,000 tons of fertilisers in the form of superphosphate and basic slag. This will be compensated by additional shipments of Irish food to this country.

OFFICIAL NOTICES

THE Board of Trade states that, despite continued lead shortage, a limited quantity has been set aside (additional to the schedules sponsored by the British, Dominion and Colonial Governments) for export to selected markets. Firms interested in the following markets should apply for licences to the Export Licensing Branch: Central, South and North America (excluding European Colonies), Portugal (and Colonies), Sweden and Switzerland. Applications must be made before December 6.

Siloxanes.—Exemption from general *ad valorem* duty of siloxanes (whether polymerised or not) has been granted by a Treasury Order made last week. The Order (Import Duties (Exemption) (No. 4) 1947. H.M.S.O., No. 2306) also relates to certain mixtures containing 50 per cent or more by weight of siloxanes.

PERSONAL

Changes at Guest, Keen & Baldwins

THE following changes in directorships have been announced by Guest, Keen & Baldwins: MR. E. J. PODE and MR. W. F. CARTWRIGHT have resigned consequent upon their appointment as directors of the Steel Co. of Wales. MR. T. JOLLY has been appointed joint managing director with MR. C. R. WHEELER, who had previously shared that post with Mr. Pode. Other appointments are: MR. J. B. DEAKIN, works manager at East Moors works, and MR. W. SMITH, assistant works manager, MR. P. T. HUGHES is now the company's chief accountant.

British Colour Appointments

At the annual general meeting of the British Colour Makers' Association the following officers and council members were appointed for the 1947-48 session:— Chairman, MR. H. G. FERGUSON (Cornbrook Chemical Co., Ltd.); vice-chairman, MR. V. WATSON (Cromford Colour Co., Ltd.); hon. treas., MR. C. G. A. COWAN (Cowan Brothers (Stratford), Ltd.); secretary, MR. ALLAN J. HOLDEN. Council: MESSRS. C. M. BEAVIS, K. BURRELL, C. G. A. COWAN, H. G. FERGUSON, J. H. GRIMSHAW, S. K. ROBERTS, V. WATSON, H. A. WILSON.

MR. ASHLEY S. WARD, chairman of Thos. W. Ward, Ltd., and other associated companies, has relinquished the chairmanship of Lowmoor Best Yorkshire Iron, Ltd., and MR. GEORGE WOOD (deputy chairman of Thos. W. Ward, Ltd.) has been appointed in his place. Other changes include the election of MR. C. L. FRY and MR. W. W. HICKMAN as directors, and the appointment of Mr. Fry and MR. R. STUBBS as joint managing directors. MR. G. F. HANSON has assumed the position of works manager.

MR. J. E. ROBINSON, chairman and managing director of John Barrington and Sons, Ltd., Dublin, the oldest soap manufacturing firm in Ireland, has been presented with a silver salver and a grandfather clock on his retirement after 50 years' service with the company.

MR. F. E. BANCROFT, of Manchester, has been awarded the premier award of the Junior Institution of Engineers, for his paper "Penicillin and the Freeze Drying Process."

MR. W. MURE has been appointed a director of Tin Smelters, Ltd.

Royal Medallists

Prof. Hinshelwood and Dr. Burnet

THE Royal Society announces: H.M. the King has been graciously pleased to approve the recommendations made by the Council of the Royal Society for the award of the two Royal Medals for the current year as follows:

To PROFESSOR C. N. HINSHELWOOD, F.R.S., for his distinguished work on the mechanism of chemical reactions from the simplest gas phase processes to the complexities of cell division; to DR. F. M. BURNET, F.R.S., for his distinguished work on bacteriophases, viruses and immunity; and for his contributions to the study of infectious disease as an ecological phenomenon.

The following awards of medals have been made by the president and council of the Royal Society:

The Copley Medal to PROF. G. H. HARDY for his outstanding part in the development of mathematical analysis in England during the last 30 years.

The Davy Medal to PROF. L. C. PAULING, for his distinguished contributions to the theory of valency and for their application to systems of biological importance.

The Buchanan Medal to SIR EDWARD MELLANBY, for his distinguished researches on the physiology of nutrition, especially in relation to the causation of deficiency diseases.

The Hughes Medal to PROF. J. F. JOLIOT, for his distinguished contributions to nuclear physics, particularly the discovery of artificial radioactivity and of neutron emission in the fission process.

DR. WALTER RAMSDEN, of Pembroke College, Oxford, Senior Fellow of Pembroke College, Johnston Professor of Biochemistry, Liverpool University, 1914-31, and formerly Lecturer in Chemical Physiology, Oxford University, left £23,211, net personalty £23,169.

Obituary

Mr. W. J. U. Woolcock

Chemical industry has lost a valuable organiser and a distinguished chemist by the death at the age of 69 of MR. W. J. U. WOOLCOCK, C.M.G., C.B.E., president of the Society of Chemical Industry from 1924 to 1926. During his term of office he was largely responsible for the representative review of chemical industry at the Wembley Exhibition. He was appointed in 1918 general manager of the Association of British Chemical Manufacturers, holding that office for 10 years, in the course of which he served on several Government committees, notably in the course of the 1914-18 war. He was also P.P.S. to the Minister of Munitions.

Overseas News Items

Courtauld's Australian Plan.—Courtaulds, Ltd., is reported to be planning to spend £2 millions over a five-year period on the construction of a factory near Newcastle, N.S.W.

U.S.A. Re-exports of Soda.—Soda ash and caustic soda have recently arrived in Argentina from the United States, being chiefly re-exports of Belgian origin. Brazil has also taken some deliveries.

Rising Tin Output.—The Malayan tin industry has made rapid progress during the past six months and production in September at 3553 tons was over 130 per cent higher than in March. At the end of September there were 439 tin mines operating, compared with 382 at the end of July, and 293 at the end of April.

A New Rubber.—An acrylic elastomer known as Lactropene EV, developed by the U.S. Department of Agriculture's Eastern Regional Research Laboratory, is now being made on pilot plant scale at U.S. Government Laboratories, operated by the University of Akron (Ohio) as agent for the Office of Rubber Reserve.

New Coalmines for Italy.—In order to offset the effect of the loss of coal production incurred as a result of the secession of Venezia Giulia to Jugoslavia, a number of coalmines are to be opened in Sardina, each of which is said to be capable of achieving an annual output of a million tons. A coal basin covering 7500 acres is said to have been discovered in Abruzzi Province. Some petroleum, bauxite and iron is believed also to exist there.

Italian Acid and Soda.—Northern Italy has raised output of sulphuric acid since the beginning of 1946—when output was at a rate of about 20 per cent of pre-war production—to about 70 per cent to-day. The change in production of electrolytic soda has been even more remarkable. Output started with over 60 per cent of the pre-war figure and climbed steadily to 80 per cent in September, 1946. Shortage of electric power during the first quarter of 1947 cut output to as litttle as 40 per cent. As soon as the conditions improved and restrictions on power consumption were removed, the output soared to nearly 100 per cent of the pre-war level in May. Prospects for electric power supplies are now not good and a decline during the next few months is likely.

Austrian Silver Nitrate.—A company in Hall, Austria, has recently resumed the production of silver nitrate at a rate of about 300 kg. per month.

Pyrites From Spain.—The shipment of some 115,000 metric tons of pyrites has been arranged by the Spanish authorities. Of this total, Belgium and Holland will take each 50,000 tons, the remainder going to the Anglo-American occupation zone of Germany.

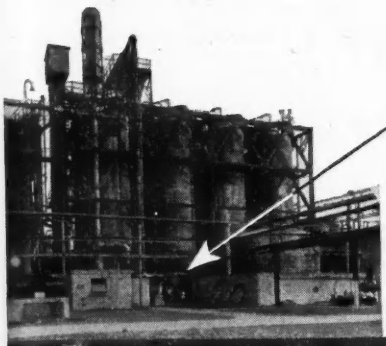
German Potash Output.—Although potash production in the British occupation zone of Germany in the third quarter of this year amounted to 62,000 tons (53,000 and 25,000 tons in the first and second quarters, respectively), the target of 214,000 tons for the year is not likely to be reached.

Sulphuric Acid in Holland.—The Sulphuric Acid Co. of Ketjen has installed a second unit for the production of contact sulphuric acid, supplies of which should now meet the total needs of Holland. Output is scheduled at 30,000 tons a year. Part of the apparatus was obtained from Dutch manufacturers.

French Coal Prices Up.—Consequent upon a French Government decision to terminate the subsidy on coal—the difference between the subsidised price (1350 francs a ton) and the cost price is estimated at 1000 francs—there has been an increase of about 60 per cent per ton in the selling price, viz., 2160 francs a ton.

Czech-Soviet Trade.—Czechoslovakia is to supply the Soviet Union with pharmaceutical products valued at 25 million Czech crowns, while the country's metal industries have signed contracts for the supply of 400,000 tons of iron ore and of 70,000 tons of manganese-ore; 10,000 tons of asbestos and some 3000 tons of chrome-ore are also to be delivered.

Cameline Oil.—Italian chemists are experimenting with cameline oil which is obtained from the Gold of Pleasure plant. They are concerned with the possibility of utilising the drying properties of this oil in view of the prevalent shortage of linseed. The oil content varies from 33 to 39 per cent in different parts of the world. Its characteristics, including a thiocyanogen number of 101, indicate a similarity with linseed oil. Practical tests carried out with paints in which cameline oil has been used, show that a drying time of about 36 hours is required. This compares with about 21 hours for linseed oil. Covering power and other properties are said to be similar.



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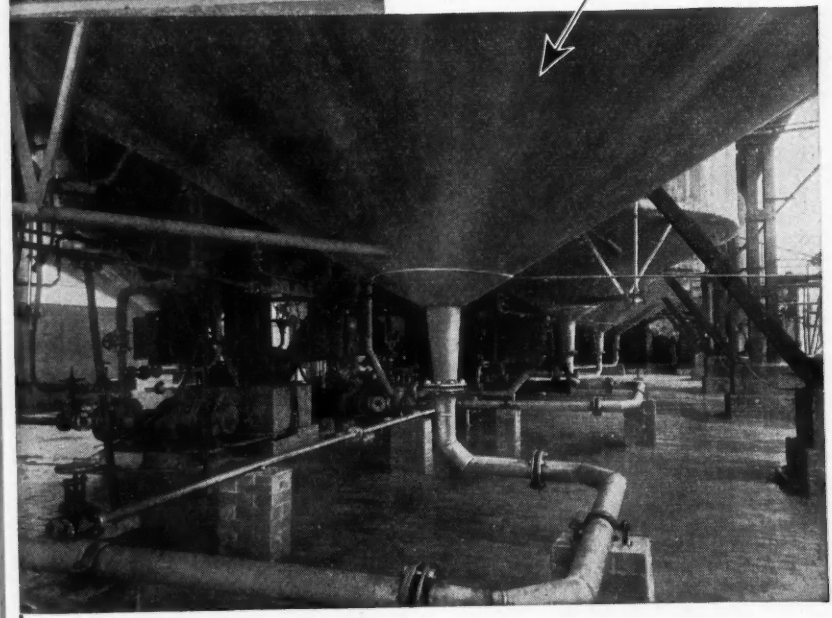

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Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

BALDWIN CHEMICAL INDUSTRIES LTD., Waltham Cross. (M., 22/11/47.) October 21, debenture, to Barclays Bank Ltd., securing all moneys due or to become due to the Bank; general charge. *—. July 1, 1946.

New Companies Registered

Burgess Chemicals and Export, Ltd. (444,805).—Private company. Capital £100. Directors: G. Burgess, and W. B. Lessing. Registered office: 121 London Wall, E.C.2.

Cochran Chemical Co., Ltd. (25,863).—Private company. Capital £1000. Directors: W. C. Galbraith, W. C. Cochrane, A. W. Chisholm, and Dr. J. Cochran. Registered office: 9 Barns Street, Ayr.

John Calder & Co., Ltd. (25,878).—Private company. Capital £1000. Importers of and dealers in sand, fire bricks, refractories, chemicals and fertilisers, etc. Directors: R. S. Calder and J. C. M. Kerr. Secretary: John N. Orr. Reg. office: 163 Hope Street, Glasgow, C.2.

Finegrades, Ltd. (445,054).—Private company. Capital £100. Manufacturers, importers and exporters of and dealers in chemicals, fine chemicals and chemical products, etc. Directors: J. W. Cox and C. E. Paddon. Reg. office: 76 Princes Gate Mews, S.W.7.

Happe Products, Ltd. (441,883).—Private company. Capital £5000. Manufacturers of and dealers in plastics, chemicals, gases, drugs, medicines, etc. Directors: G. Schight, G. J. Selbie and E. L. Selbie, W. R. J. Happe, and R. F. Selbie. Registered office: Room 150, 20 Copthall Avenue, E.C.2.

Jacksons Fertilisers, Ltd. (444,934).—Private company. Capital £1000. Manufacturers and importers of and wholesale and retail dealers in fertilisers, manures, chemicals, insecticides, fumigants, fungicides, disinfectants, weed killers and washes, etc. Directors: J. Jackson and N. F. R. Gill. Reg. office: Park Hall, Longton, Staffs.

Company News

Distillers Company, Ltd., has declared an interim dividend on the ordinary stock for the year ending March 31, at 3 3/5d. per unit of 4s., less income tax.

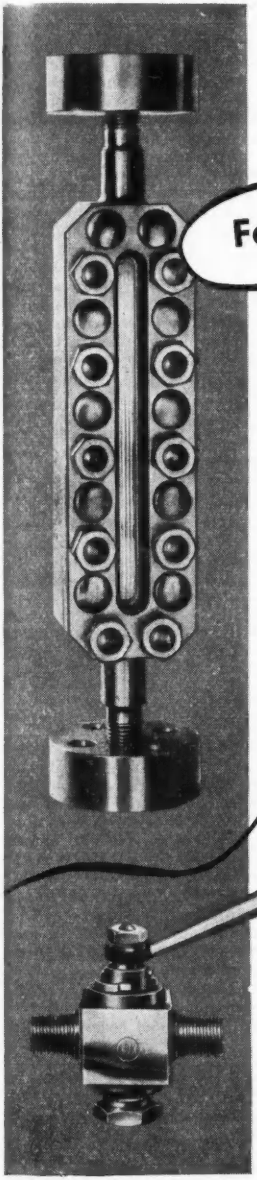
The nominal capital of **Synthetic Chemicals Ltd.,** Braemar, Cleckheaton, has been increased beyond the registered capital of £5000, by £495,000, in £1 ordinary shares.

The nominal capital of **Chemicals and Essential Oils Ltd.,** Astor House, 95 Aldwych, London, W.C.2, has been increased beyond the registered capital of £1000 by £4000, in £1 shares.

Increases of the nominal capital of nine Mediterranean petroleum companies are announced as follows: **Petroleum Development (Qatar), Ltd.,** by £1,600,000 (registered capital £2,540,100); **Lebanon Petroleum Co., Ltd.,** by £300,000 (registered capital £500,100); **Basrah Petroleum Co., Ltd.,** by £1,400,000 (registered capital £5,000,000); **Mosul Petroleum Co., Ltd.,** by £700,000 (registered capital £8,700,000); **Petroleum Development (Trucial Coast), Ltd.,** by £150,000 (registered capital £500,100); **Syria Petroleum Co., Ltd.,** by £1,200,000 (registered capital £2,250,100); **Transjordan Petroleum Co., Ltd.,** by £250,000 (registered capital £200,100); **Petroleum Development (Palestine), Ltd.,** by £700,000 (registered capital £920,100); and **Petroleum Development (Cyprus), Ltd.,** by £100,000 (registered capital £60,100).

Chemical and Allied Stocks and Shares

THE dramatic developments at the end of last week have dominated stock markets, where continued uncertainty has kept business at modest proportions. Immediately following the interim Budget, industrial shares made strong headway because Mr. Dalton's proposals were regarded as indicating no serious attempt to deal with inflation, while market calculations showed that in many cases the doubled Profits Tax will be offset in future results by the repeal of E.P.T. which takes effect as from the begining of this year. It was pointed out that this assumed that trading profits would be maintained in future, which as far as concerns companies limited to the home market is by no means likely owing to the emphasis on export markets. Then followed the resignation of Mr. Dalton. The City took the view that Sir Stafford Cripps would favour more definite methods in dealing with inflation; and in some quarters it was suggested that he might in fact

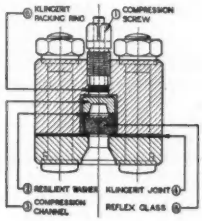


Klinger TYPE S.300 REFLEX LEVEL INDICATORS

For Working Pressures of 300 Atmospheres

This level gauge is so designed that the glass is not subjected to high mechanically applied stresses in order to make a tight joint. Tightness of the joint is provided by the internal fluid pressure so that the glass is evenly loaded and free to adjust itself in the gauge body to inequalities of expansion.

The compression screw (1) provides initial pressure only between the reflex glass (5) and the Klingerit joint (4), via the compression channel (3) and the resilient washer (2). The actual sealing pressure on joint (4) at high pressures is given by the internal fluid pressure on the rear of the reflex glass (5). Leakage past the compression screw (1) is prevented by the Klingerit packing ring (6). Similarly designed gauges are available for 400 atmospheres (6,000 lbs. per square inch pressure).



Klinger HIGH PRESSURE SLEEVE-PACKED COCKS

The small steel cock shown (3/16" bore) is suitable for a working pressure of 6,000 lbs. per square inch. It opens and shuts with a 90° movement of the lever, travel being limited by a stop, and when open gives a straight through uninterrupted full bore passage.

The cock depends for its tightness on the renewable compressed asbestos Packing Sleeve (illustrated) which is fitted with conical stainless steel eyelets. Klinger High-Pressure Sleeve-Packed cocks can be made in several sizes with any desired type of connection.

RICHARD KLINGER LTD.

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modify the "cheap money" policy so carefully fostered by his predecessor.

It became clear following his first speech as Chancellor that for the time being at any rate Sir Stafford will support "cheap money" but the City is still doubtful if the forthcoming big issue of British Transport stock can be made to carry interest at only 2½ per cent. A 3 per cent interest basis is now more widely expected. Industrial shares have eased, but in most instances are still above pre-Budget levels, shares of companies prominent in the export drive being favoured.

Shares of chemical and allied companies moved fairly closely with the general trend, but in many instances were higher on balance, although best levels have not been held. Imperial Chemical were 49s., and Fisons ordinary strengthened to 66s. 3d. helped by the success of the 4½ per cent preference share issue. The latter shares changed hands around 24s. or 1s. premium over the issue price. B. Laporte were 82s. 9d., and W. J. Bush 87s. 6d., while in other directions, British Aluminium strengthened to 48s. 9d., although British Glues & Chemicals 4s. shares at 21s. 3d. lost part of an earlier rise.

Glaxo Laboratories at £22½ moved higher in view of market calculations that doubled Profits Tax will not bear heavily in this case, because it will be offset by the absence of the E.P.T. provisions in future. British Drug Houses 5s. shares at 13s. 3d. have also been favoured on similar grounds and on attention drawn to the company's big export trade. The units of the Distillers Co. fluctuated moderately around 28s., United Molasses were firm at 48s. 9d. British Plaster Board steadier at 22s. 3d., and Turner & Newall higher on balance at 76s. 3d. Iron and steel shares have been steady, helped by the encouraging coal output news. Tube Investments at £6⅝ strengthened following the raising of the distribution from 22½ per cent to 25 per cent, and Stewarts & Lloyds (54s. 6d.) rose in sympathy. United Steel changed hands around 26s. 7½d. Dorman Long were 28s. 3d., awaiting the results, and T. W. Ward rose further to 49s. 3d.

Boots Drug became steadier at 57s., Sangers were 33s. 1½d., and Griffiths Hughes 41s. 10½d., but awaiting the £1,500,000 issue of 4½ per cent redeemable cumulative preference shares at par, Beechams deferred eased to 22s. British Xylonite shares were quoted at £7 "ex rights" to the new shares which were 22s. 6d. premium. Oils have been steadier with V.O.C. (95s. 7½d.) higher again under the influence of the increased interim dividend. Shell were 74s. 4½d. earlier in the week pending official details of the big share issue which is expected to raise £30,000,000 for the company's big refinery programme.

British Chemical Prices

Market Reports

CONDITIONS throughout the industrial chemicals market remain very much as have been reported over the past month. Buying orders, whether for home needs or for export, are by no means easy to place owing to the uncertainty of the forward supply position. Consumer delivery specifications under existing contracts are being met with promptness and the movement in the aggregate is fairly substantial. No price changes have been reported on the week, and the undertone is very firm, particularly among the potash chemicals. A brisk trade and a ready outlet for supplies sums up the position of most of the soda compounds, and this is also the case with such items as formaldehyde, acetone, the lead oxides and oxalic acid. Available supplies are fully absorbed in the coal-tar products market where conditions and prices remain unaltered.

MANCHESTER.—The chemical using industries generally in the Lancashire area are maintaining a steady rate of operations, with an upward trend in the cotton textile and allied industries; this is reflected in a sustained brisk demand for a wide range of both light and heavy chemicals. A steady flow of delivery specifications has been reported on the Manchester market during the past week and offers of new business both on home and export accounts have been fairly numerous. Values are strong in all sections. The tar products generally continue to find a steady outlet, with supplies tending to fall below requirements in several instances.

GLASGOW.—In the Scottish chemical market there has been a sustained demand over the whole range of chemicals, both heavy and light. There has been a steady increase in demand as new factories have been completed and there is scope for more chemical producers in the area. Natural resources invite such development. In the export market there has been a noteworthy demand from the Argentine for chemicals of all classes and, judging by reports, it seems likely that in the future this country will be buying considerable quantities of various materials from the U.K. There has been little demand from Spain, due to the very great difficulty of obtaining import licences. In general, the demand has been steady and some orders have again been received.

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Abridged Particulars.

PHILIP HILL & PARTNERS LIMITED

announce an issue by

BEECHAM GROUP LIMITED

of

1,500,000 4½ per cent. Redeemable Cumulative Preference Shares of £1 each at par

Applications from Shareholders in Beecham Group Limited if made on the special pink forms provided will be given preferential consideration on allotment.

The Subscription List will open and close on Wednesday, the 26th November, 1947.

The Prospectus shows (inter alia) :

(1) Beecham Group Limited was incorporated on 23rd January, 1928 under the name of Beechams Pills Limited and changed its name to Beecham Group Limited in 1945. As a result of a vigorous policy of expansion, it now controls 111 Companies and overseas Branches. The home turnover of the Group is now made up (approximately) as to Food Products, 50 per cent., Cosmetics and Toilets, 17 per cent., Pharmaceuticals, 32 per cent. and Veterinary Products, etc., 1 per cent.

(2) Particular attention has been paid to the Group's export business, which has been expanded in nearly every part of the world under the management of Beecham Export Corporation Limited, a wholly owned subsidiary. In the last four years the profits earned from export and overseas trade (before taxation) have risen by over 50 per cent. to a new high level of £644,745 for the year ended 31st March, 1947. This side of the business is being actively developed and for the first half of the current financial year there has again been an increase in turnover and profits compared with the same period in 1946.

(3) The combined profits of the Company and its subsidiaries for the year ended 31st March, 1947, as shown by the Auditors' Report amounted before U.K. taxation, to £2,241,916. After providing for estimated taxation on the present basis including the Budget proposals as announced by the Chancellor of the Exchequer on the 12th November, 1947, the net profits amount to £713,780 which is equivalent to a gross amount, before U.K. income tax at 9/- in £, of £1,297,782.

Of this sum the annual preferential dividend payable upon the 10 per cent. Cumulative Preferred Shares of the Company absorbs the gross amount of £200,000 **which leaves a balance of £1,097,782** before deducting the annual dividend on the 300,000 5 per cent. Redeemable Cumulative Preference Shares which are to be redeemed on the 31st March, 1948.

(4) **The gross amount required to pay the annual dividend on the 1,500,000 4½ Per Cent. Redeemable Cumulative Preference Shares to be offered is £67,500.**

(5) The proceeds of the present issue will be utilised as to £300,000 towards repayment on the 31st March, 1948 of the 300,000 5 per cent. Redeemable Cumulative Preference Shares, and as to the balance for the general purposes of the Company.

Copies of the Prospectus, on the terms of which alone applications will be considered, and forms of application are now obtainable from :

Bankers :

MIDLAND BANK LIMITED, New Issue Department, Poultry, London, E.C.2, and Branches.
COUTTS & CO., New Issue Department, 440, Strand, London, W.C.2.

Brokers :

JOSEPH SEBAG & CO., 22, Old Broad Street, London, E.C.2
and The Stock Exchange, London.

Registered Office of the Company :

55/56, Pall Mall, London, S.W.1.

and from

PHILIP HILL & PARTNERS LIMITED

Kingsbury House, King Street, St. James's London, S.W.1

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SITUATIONS VACANT

None of the vacancies in these columns relates to a man between the ages of 18 and 50 inclusive, or a woman between the ages of 18 and 40 inclusive, unless he or she is exempted from the provisions of the Control of Engagement Order, or the vacancy is for employment exempted from the provisions of that order.

COMPANY Secretary/Accountant required by established firm of chemical manufacturers. Permanency with prospects and good salary to right man. Applications, stating qualifications, previous experience, when free, and salary required, to "G.D." ATHOLE G. ALLEN (STOCKTON) LTD., Bowesfield Lane, Stockton-on-Tees.

FIRM in Home Counties invites applications from qualified Chemists, preferably (but not necessarily) with some experience in organic or physical chemistry, for research on Plastic Materials. Permanent position with attractive salary and good prospects. Apply in strict confidence, giving usual particulars. Box No. 2557, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

JUNIOR Assistant, inter-standard, required for works laboratory, 15 miles S.E. London. Preferably two or three years' practical experience. Work partly analytical, and assisting research on wide range of topics. Box No. 2556, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

PLANT Chemists urgently required for Process Plant Operation by large company operating in the Middle East. Applicants need not be Graduates but should have had a chemical training up to Inter. B.Sc. or National Certificate Standard with experience of shift work in either a gas, coke oven or chemical works. Age not over 30. Salary in sterling between £540 and £600 per annum, plus generous allowances in local currency, with free furnished bachelor accommodation, passages out and home, medical attention, also kit allowance and Provident Fund benefits. Apply, stating age, qualifications and experience, etc., to Dept. F.22, Box No. 2435, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

RESEARCH Chemist required by large tar distillation and oil refining company. Applications in writing to: THE PERSONNEL MANAGER, The Midland Tar Distillers Ltd., Oldbury, Birmingham.

SITUATIONS VACANT

WANTED. Cement Works Chemist required for Hong Kong. Commencing salary, £750 per year, rising to £1,000 by annual increments of £50. Present cost-of-living allowance, $500 per month (H.K. dollar stabilised at 1s. 3d.), subject to revision time to time. Preferably unmarried. First agreement five years. Provident fund. Appointment immediate future. Reply Box No. 2558, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

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AUTOCLAVE, vertical, cast steel 39 in. I.D. by 5 ft. 6 in. deep, not jacketed, bolted cover, high pressure, as new £80. THOMPSON & SON (Millwall) Ltd., Cuba Street, Millwall, London, E.14.

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Two Identical Enclosed OVERDRIVEN VERTICAL MIXERS by S. H. Johnson & Co., Stratford, comprising Doulton-ware unjacketed porcelain vessels with cover 15 in. dia. by 20 in. deep, with bottom side run-off, fitted internally with porcelain covered mixing gear, overdriven through vertical shaft worm reduction gear-box with bedplate for motor, carried in mild steel frame work.

Horizontal Internal MIXER by Follows & Bates, having pan, 13 in. by 13 in. by 14 in. deep, U-section, arranged for tilting and in which are two scythe-type blades inter-rotating and driven through enclosed gearing by fast and loose pulleys.

Vertical Unjacketed OPEN-TOP OVERDRIVEN MIXER, approximately 3 ft. dia. by 3 ft. deep, simple type agitating gear, steam coil in bottom of pan, bottom discharge.

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ONE ROTARY KILN DRIER by Ernest Newell, fired by Town Gas, 76 ft. 4 in. long × 7 ft. 4 in. diam. refractory lined and constructed from ¾ in. welded mild steel plate; driven by 20 h.p. totally enclosed E.E.C. slip ring motor, 400/440/3/50, 727 r.p.m. complete with rotor stator oil immersed starter. Drier is fed by 39 in. diam. rotary feed table, driven by 1½ h.p. E.E.C. geared motor with Croft inbuilt reduction gear and Allen West starter, incorporating feed hopper 8 ft. × 8 ft. × 8 ft., on straight, with 6 ft. conical section tapering to 12 in. discharge.

DUST COLLECTOR CYCLONE constructed from ¼ in. welded plate, 8 in. diam. × 5 ft. on straight with 9 ft. conical bottom section tapering to 8 in. outlet, carried in angle structure.

COMBUSTION CHAMBER carried on steel staging with chequer plate flooring, hand rails and steel stairways.

MUSGRAVE INDUCTION DRAUGHT FAN driven by 18 h.p. Sturtevant totally enclosed motor running at 1460 r.p.m. 400/3/50.

ONE KEITH BLACKMAN HIGH FREQUENCY BLOWER EXHAUSTER driven by 35 h.p. slip ring E.E.C. variable speed motor, 1450/1000 r.p.m. with Ellison oil immersed hand-operated starting equipment.

SELF-SUPPORTING CHIMNEY, 52 ft. high × 3 ft. dia. constructed from ¾ in. welded plate with 24 ft. access ladder.

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DELIVERY from stock.
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RECTANGULAR Jacketed Vacuum Oven 7 ft. × 3 ft. 6 in. × 3 ft.
400 feet of 18 in. 6 in. Pitch Gravity Roller Conveyor.
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20 Welded Steel jacketed Pans, 40 gall., tested 100 lb hydraulic pressure on three legs; bottom outlet £20 each. THOMPSON & SON (MILLWALL) LTD., Cuber Street, London, E.14.

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Jacketed Mixing Pan, 7 ft. dia., 9 ft. deep.
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Ditto, 62-tons capacity.
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Mixing Pan, 6 ft. diameter by 5 ft. deep, flat bottom, open top.
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No. 3 Miracle Mill, "Super" Hammers, no Cyclone.
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Enclosed Drum Mixer, 8 ft. long, 5 ft. diameter, welded construction, copper lined.

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LONDON FIRM offers complete service packing powders of all descriptions, also liquids and chemicals. Long runs only. Containers and packing cases for home and export, made on premises. Near to docks. Own rail sidings. Box No. 2331, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

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WANTED

FORMALDEHYDE 40% urgently required. State price and quantity. GEORGE RICE LIMITED, Warton Road, Stratford, E.15. Telephone—Maryland 1222.

PFAUDLER glass enamel shallow steam jacketed evaporating pans, 25-100 gall. capacity urgently required. METALLURGICAL CHEMISTS LIMITED, Gresham House, London, E.C.2.

STAINLESS STEEL (FDP) pans and mixers, steam jacketed or open with coil up to 500 gall. capacity wanted. MECHEMA, 219, Gresham House, London, E.C.2

WANTED, Betanaphtol, Sodium Nitrite, Sodium Sulphide, Caustic Soda, Soda Ash, any quantity, single drums to many tons. Please offer with fullest details, quality, percentage, and packing to Box No. 2559, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

WANTED.—Supplies of Nitre Cake in ten-ton lots, Box No. 2126, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

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KING'S PATENT AGENCY, LTD. (B. T. King, A.I.Mech.E., Patent Agent), 146a, Queen Victoria Street, London, E.C.4. ADVICE Handbook, and Consultation free. Phone: City 6161.

AGENCY

EXPORT.—We have the organisation and connections for handling all types of chemicals in the export market. Send us details of chemicals you have available for overseas markets. R. CRUIKSHANK LTD., Camden Street, Birmingham, 1.

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THE Proprietors of British Patent No. 512583, entitled "Improvements in Preparation of Salts of Hexamethylenetetramine," offer same for licence or otherwise to ensure its practical working in Great Britain. Inquiries to SINGER, EHLERT, STERN & CARLBERG, Chrysler Building, New York, 17, N.Y., U.S.A.

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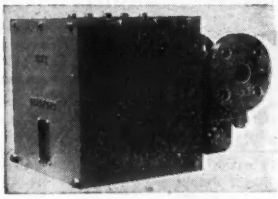

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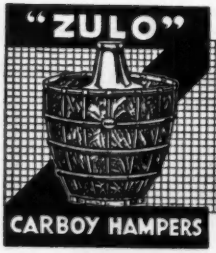

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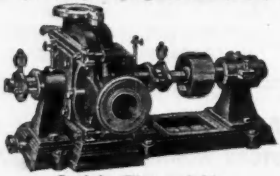

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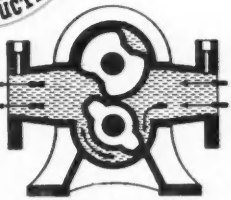

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